REPORT

ON THE

CULTIVATION AND TRADE OF WHEAT IN INDIA,

BY THE

DIRECTOR OF THE AGRICULTURAL DEPARTMENT,

BENGAL.

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OFFICE OF THE DIRECTOR OF AGRICULTURAL DEPARTMENT, BENGAL.

No. 391T.

FROM M. FINUCANE, ESQ., C.S.

Director of the Agricultural Department in Bengal,

TO THE SECRETARY TO THE GOVERNMENT OF BENGAL,
REVENUE DEPARTMENT.

Dated Darjeeling, the 7th July 1886.

SIR,

I HAVE the honour to acknowledge the receipt of your letter No. 1439—43Agri., dated 25th January, forwarding papers on the subject of the wheat trade in India, and inviting attention to certain points connected with the cultivation of and trade in that article, on which report was called for. These points were—

(*1st*) The necessity of obtaining clean grain for export.

(*2nd*) The improvement of the species grown, with special reference to the encouragement of the growth of valuable white wheat on suitable soils, and the effect of different soils in changing the colour of the grain.

(*3rd*) The provision of facilities for storing wheat near railway stations in warehouses, where, as proposed by Messrs. Reinhold Brothers, grain might be received, cleaned, and graded on the American system.

(*4th*) The preparation of forecasts and dissemination of such information on the subject as may be of practical use to the public.

2. On receipt of your letter under acknowledgment, a communication, of which a copy is annexed, was addressed to the agricultural officers at Patna, Bhagulpore, and Burdwan, in which these points were discussed, and it was requested that further information on the subject should, if possible, be furnished. The Commissioners of divisions were separately asked by Government to report on the question through me. All the reports of the officers consulted have now been received and are submitted with this letter.

3. Regarding the question of obtaining clean grain for export, the following remarks were made in my letter of the 2nd September—

"The impure condition of Indian as compared with the wheat of other countries is attributed to one or more of the three following causes :—

1st.—The mixture of other grains due to the practice of growing two or more crops on the same land at the same time.

2nd.—Imperfect arrangements for winnowing the grain and removal of extraneous matter.

3rd.—Deliberate adulteration by traders, brokers, or others.

"As regards the first of the causes enumerated above, it will be observed that the Bengal Government, in circulating among Commissioners the letter from the Government of India, No. 57A, dated 10th August 1883, with Mr. Bolton's circular No. 7T—R, dated 4th September 1883, desired these officers to issue instructions to Collectors of wheat-producing districts, in accordance with the wishes of the Government of India, to impress on wheat-growers the importance of preventing the admixture of other grains with wheat, and at the same time called upon them to report the action which Collectors might take in the matter. The Commissioners generally reported, in reply, that little could be done, but

added that all that was possible would be done in making known to the cultivators the importance of keeping their wheat free from foreign substances. The Assistant Commissioner of Palamow went further than this, and promised that he would endeavour to persuade cultivators to sow their wheat by itself in the course of his next cold-weather tour; while the Commissioner of Patna submitted for the approval of Government a draft circular which he proposed to issue to zemindars, putwaries, and others, pointing out to them the disadvantage of growing wheat in the same fields as other grains. Attention has, however, been called since that time to the circumstance that the cultivator, in growing oilseeds or other crops with wheat, selects such crops as are likely to succeed in a drought when wheat fails, and thus protects himself against the risks of an unfavourable season. Bengal wheat contains a large admixture of linseed, stones, and mud. The standard of refraction in Calcutta being 5 per cent., any refraction there may be over and above this standard is deducted from the value of the parcel. If, for example, the refraction is 8 per cent., a deduction is made of 3 per cent.; but it is to be remembered, on the other hand, that as 5 per cent. is ordinarily deducted, it is doubtful whether cultivators would under existing arrangements derive any benefit from the production of entirely clean grain or grain in which there may be less than 5 per cent. of foreign matter. It is found in the trade that mud can be got rid of, but there is no process known by which linseed or barley can be separated from the wheat, and hence it happens that parcels containing an admixture of mud sell better in the London market than parcels containing an equal weight of admixture of other grains. It is to avoid this admixture that merchants agitate against the simultaneous growth of two or more crops with wheat in the same field.

"The advantage of producing clean wheat would, as a matter of course, be represented by the smaller refraction of say two per cent. over and above the minimum of 5 which might be charged on pure wheat if it could be generally procured; but it is yet to be shown that any appreciable part of this advantage would reach the cultivator as long as a uniform minimum standard of refraction is adopted by the exporters in Calcutta. That, then, the growth of other crops simultaneously with wheat in the same fields is, under all circumstances, to be deprecated, does not appear to be a conclusion so obviously certain *a priori*, or so firmly established by the results of experience, as to warrant, for the present at all events, the active interference of Government officers in discountenancing the practice. In the present state of our knowledge on the subject, all that it seems desirable to do, is, to point out to the cultivator the advantages, such as they are, of producing clean wheat, and of separating the hard and soft and the white and red grains in the selection of seed, and to leave it to him to determine whether the reasons for growing a mixed crop are outweighed by the reasons for growing it alone. The question, however, is one which demands further enquiry, and I request that you will give it your attention and report upon it in due time."

4. On the first of the causes enumerated above, to which the impurity of Indian wheat was attributed, namely, the admixture of other grains, due to the practice of growing other crops on the same land at the same time, the reports now received show that there is unanimity of opinion to the effect that Government should not interfere with a view to discourage the growth of other crops with wheat. Cultivators are not indifferent to the advantages of producing clean grain, but they prefer to grow mixed crops with a view to secure a better outturn, and at the same time to guard against the risk of failure to which they would be liable by growing an unmixed crop. The advantage from the cultivator's point of view of sowing wheat alone is not clear, for by growing a double crop he gets a chance of securing something if the wheat fails, and moreover when a deep-rooted crop like wheat is grown with a surface feeder like barley, each stalk of wheat has a larger area for its roots, and the grains are likely to be fuller and heavier than if only wheat were sown. For these reasons it would appear that the active interference of Government officers with a view to discountenance the practice of growing other crops simultaneously with wheat is not warranted. All that officials can safely do in this direction, is to circulate information showing the prices which may be realised in Calcutta for entirely clean and for impure grain respectively, leaving it to cultivators themselves to determine whether the reasons in favour of growing a mixed crop outweigh those in favour of growing wheat alone. The strength and force of these reasons will, as shown later on, entirely depend on the efficacy of any action which the Chamber of Commerce may find it possible to take towards altering the present system, under which a uniform minimum standard of refraction is adopted by the exporters in Calcutta.

5. With regard to the third cause given for the impurity of Indian wheat, namely, deliberate adulteration on the part of middlemen or cultivators by admixture of dirt, an opinion was expressed in my letter of September 2nd, on which comment was invited from the Chamber of Commerce, to the effect that the real reason why Indian wheat is adulterated by admixture of foreign substances lies, not in defectiveness of winnowing arrangements, but in the

fact that it is not to the cultivator's interest to produce entirely clean grain; for so long as a minimum of 5 per cent. refraction is deducted by exporters in Calcutta, it is evident that it is the interest of the producer to mix dirt with the grain to that extent at least. It was suggested that the remedy therefore lies, not in the introduction of better winnowing arrangements, so much as in the alteration of the present system of deductions for refraction. A very remarkable confirmation of this view is afforded by Mr. Allen's interesting report, which I quote at length on this point:—

"Similar arguments," he says, "apply to adulteration of mud, &c. These, I believe, the ryot does not add wilfully, because the bepari or petty trader to whom he sells would detect them in his small consignment and pay him an inferior price. On the other hand, the petty trader does not insist on cleaned grain, for he will not himself sell grain containing less than 5 per cent. of impurities, which, if deficient, he will add; for so long as the Calcutta merchants accept 5 per cent. as refraction, it would not pay the bepari to sell grain with only one or two per cent. of adulteration. This brings me to the real point of the whole question. It is purely a case of supply and demand. If the Calcutta merchants insisted on cleaned grain, they would get it. They do insist on clean samples in the case of linseed, and the result is that linseed is cleaned by the actual cultivators before being sold to the petty dealers. The same result would, I believe, follow in the case of wheat. As matters now stand, wheat in Patna is freely adulterated. Ralli Brothers in Patna City deal only with the petty dealers, and these refuse to give any guarantee with the wheat sold. Each lot has to be tested both for impurities and for the percentage of red grain before the price is fixed. If the samples tested happen to be superior to the bulk, the bepari gains. If they should be inferior, the bepari can refuse to deal, and so he cannot lose either way. The cultivators never get a fair price, for the brokers and the aratdars have each to get their commissions on each transaction between the bepari and Ralli Brothers. In some marts where the grain comes chiefly from the neighbourhood it might be possible for Ralli Brothers to deal directly with the actual cultivators; but in Patna, where the grain comes largely from Gorakpore and Fyzabad, this is impossible, and the agent for Ralli Brothers is compelled to deal with the petty dealers, whose interest it is to cheat him if they possibly can.

"Since writing the above, I have had a remarkable confirmation of these views from the manager of the Dumraon Raj, the Hon'ble Jai Prokash Lall. The statements he made were so significant that I took a note of them at the time, and at the same time informed him that I should embody them in this report. The manager said that about two years ago, when the prospects of the wheat trade were apparently good, he seriously thought of cultivating wheat on a large scale. He estimated that on the Raja's estates there were 300,000 acres of land capable of growing wheat, and he proposed commencing operations with a capital of two lakhs. His idea was to induce the ryots to grow wheat alone by means of advances in coin and seed, and he intended purchasing machinery such as he had seen at the Calcutta Exhibition for cleaning the grain. All that he now required was a remunerative market. Last year, when in Calcutta on Council business, he called at the office of Ralli Brothers, and after telling them his plans asked what price they would give for clean grain. *Ralli Brothers informed him that owing to the action of the merchants in England they could not afford to pay more for a clean sample than they now did for grain with 5 per cent. refraction. Upon hearing this the manager abandoned the idea of growing and cleaning wheat on a large scale.* It is difficult to overrate the significance of this anecdote, which appears to prove conclusively that so long as merchants will not pay a higher price for clean grain, it is useless for Government to think of inducing cultivators to change their present practice.

"I then asked the manager about wilful adulteration. He said that he had a gola at Itari, near Buxar, from which he used to sell wheat on rather a large scale to the agent of Ralli Brothers at Buxar. The wheat as he got it did not contain 5 per cent. of foreign matter. Accordingly, his servants were directed to mix two maunds of earth with every 100 maunds of grain, so as to bring the adulteration up to the required standard. This earth was treated with water and specially prepared for the purposes of adulteration. The suggestion for adulterating the grain in this way came, as the manager says, from the employés of Ralli Brothers. This fully bears out what Major Boileau says, that grain-dealers in Dinapore wilfully adulterate their grain, adding about two maunds and thirty seers of dry clay, bhusee, and other grains to every hundred maunds of wheat. Mr. T. Gibbon, C.I.E., the manager of the Bettiah Raj, told me that wilful adulteration was practised by the petty dealers in Chumparun, and Mr. Carnduff, writing from Hajipore, a large grain mart, says:—'In the hands of the middlemen, when the grain is lodged in their golas, such grains as *akla pipra* are, I understand, intentionally added with a view to adulteration.' Mr. Jenkins from Buxar, who has clearly paid a good deal of attention to the subject, is of the same opinion.

* * * * * *

"Messrs. Mylne and Thompson have pointed out to me that the adulteration of *gur* is analogous to the adulteration of wheat. When their sugar-mills were first introduced, they were valued by the purchasers on account of their saving labour, and not because they turned out a cleaner article. Even now the Bunniahs in Jagdispore refuse to pay a higher price for *gur* free from adulteration, and though the cultivators *can* produce clean *gur*, and *will* do so if required, it does not pay them to clean the *gur* they sell in open market. There is now, however, a tendency among European firms to pay a higher price for purer *gur*; similarly, if the

merchants would reduce their standard of refraction, they would get cleaner samples of wheat. This question is treated exhaustively in the report from Shahabad, and it is so difficult to make extracts without omitting something of interest that I venture to suggest that the whole report be sent in original. The possibility of cleaning grain with the ordinary tray-shaped fan (soop) is pointed out by the Collector of Sarun, and in the report from the Patna district."

6. As regards, then, the alleged imperfection of present arrangements for winnowing, it will thus be seen that the mixture of dust from the threshing-floor forms a very small portion of the impurities found in Indian grain, and that the present arrangements for winnowing are as good as can be hoped for under present conditions. It will of course be desirable to effect improvements in winnowing and threshing, should any be found possible; but the root of the evil complained of can only be reached by the abolition of the system of deducting a minimum refraction of 5 per cent.—a remedy which lies in the hands of the merchants themselves. The facts mentioned by the manager of the Dumraon Raj show conclusively that clean grain will be forthcoming if the merchants pay for it, and that it will not be forthcoming, however perfect the winnowing and threshing arrangements may be, so long as a minimum of 5 per cent. is deducted for impurities, be the samples ever so clean.

7. These facts and arguments have been brought to the notice of the Calcutta Chamber of Commerce who, while not denying their force, express regret that they are unable in the present state of the trade to alter the existing practice in this respect. As long as that practice continues, it would appear to me to be futile for Government officers to talk to cultivators of the advantages of producing entirely clean grain. On the contrary, if Government officials interfere at all in the matter, it should be by explaining to the cultivators that it is their interest to mix at least 5 per cent. of foreign matter with clean grain before offering it for sale.

8. Turning to the questions of the improvement of the species grown and colour of the grain, it appears that Bengal, like other provinces, grows a variety of wheat grains which cannot be reduced to a uniform or scientific classification. The four principal kinds exported from Calcutta are—

No. 1 club, containing 75 per cent. of white and 25 of red.
No. 2 club, containing 65 per cent. of white and 35 of red.
No. 3 hard red.
No. 4 soft red.

Buxar sends No. 1 club—a very superior soft white grain. It is extensively grown in the southern part of that sub-division and in Sasseram, and is equal in quality to the best Delhi or Mozufferpore wheat. Bhagulpore grows hard and soft red, while Bengal principally sends soft red only—a grain of very inferior quality.

A sample of Buxar wheat grown in the sub-division of that name and picked up in a local bazar, was sent to the Chamber of Commerce, and appraised by the Committee of the Calcutta Wheat and Trade Association. It was declared to be superior in quality to the ordinary No. 1 club of trade, as the sample contained no red grain, while the ordinary No. 1 club contains a mixture of 20 to 25 per cent. of red. It thus appears that there is grown within these provinces a species of wheat equal or superior to that of any other part of India, and therefore that there is no need to travel outside for the purpose of procuring superior seed. In ignorance of this fact attempts have from time to time been made to introduce seed-grain from Cawnpore, Delhi, and Mozuffernagur, even the Chamber of Commerce being itself, I believe, unaware that Buxar No. 1 club is largely produced in the Buxar and Sasseram sub-divisions and in other parts of Behar. There is reason to believe that the cultivation of this species might be profitably extended in the south Gangetic districts of Behar, should the Chamber of Commerce see its way to effecting an alteration in the present system of refraction, thus causing superior white grain free from dirt to command an adequate price. Samples of the red wheat produced in Bhagulpore were also appraised by the Committee of the Calcutta Wheat and Trade Association, to whom my thanks are due for the assistance they have given in the matter, and it was found that this grain was four annas per maund inferior in value to the Buxar grain. Since the imposition of a duty on wheat in France, the demand for this species has very much fallen off. Attempts have accordingly been made by Mr. Hossein, the Agricultural Officer at Bhagulpore, to introduce

Buxar wheat in that division with very satisfactory results. Though the quality of Cawnpore wheat which was supplied by the Chamber of Commerce for experimental cultivation in Bhagulpore slightly deteriorated, yet it was found that Buxar seed which was also tried in the same district yielded a grain, declared by the Committee to be "a splendid description of wheat, soft, mellow, bold, regular and of good colour." Its value is two annas per maund over that of ordinary Buxar quality, which itself is four annas per maund superior in value to the grain now grown in Bhagulpore. Mr. Hossein has been instructed to endeavour to extend the cultivation of this grain in Bhagulpore. The soil and climate of the Shahabad, Patna, Bhagulpore and Monghyr districts seem to be well suited to the growth of wheat, while these districts, as will be seen from the annexed statements, enjoy considerable advantages in point of cost of carriage of the grain to Calcutta amounting to four to five annas per maund, over cultivators of the districts of the North-Western Provinces.

9. The soil best adapted to the growth of the superior kinds of wheat is described by Mr. Jenkins, the Sub-divisional Officer of Buxar, to be "Karail," a black heavy loam.

In Bijhowra village, he remarks, where the best white wheat is grown, the soil is a mixture of karail and banga in proportion of $\frac{3}{4}$ to $\frac{1}{4}$; the land is first ploughed in Assar (second half of June and first half of July) and is reploughed eight times before Asin (second half of September and first half of October), "when it is harrowed and the seed is then sown. In fields where two or more "different kinds of seed are to be sown, all the seeds are mixed and sown at the "same time."

Mr. Peppe of the Opium Department, who has made the wheat trade a subject of special enquiry, makes the following observations on this point:—

"There are two principal tracts in which wheat is largely grown in this district; the first is the alluvial soil called the deara, extending from Buxar to the Sone and reaching a maximum breadth of 10 to 15 miles with a length of say 40 miles, thus including less than 400 square miles. This is the tract in which the beautiful soft white wheat is grown; the land is a rich alluvium annually enriched by the overflow of the Ganges: it is needless to say that no manure is required in this soil for the finest wheats, and that it is in this tract possible to grow as fine wheat as anywhere in India; unfortunately it is in this very tract that the cultivators sow three or four and even more crops in the same field, and this is a fertile source of dirty grain, as when reaped separately they are very often pulled out by the roots (not cut), and this carries an unusual amount of dirt with the grain on to the threshing-floor, but it can be easily separated if the raiyat chooses to take the trouble. From what I can gather, about 40 per cent. of the best wheat comes from this tract. The next in importance is the black clay soil extending from the eastern part of the Sasseram sub-division well into the Bhabooah sub-division, and extending from the Grand Trunk Road on the one side, and on the other to within 15 miles of the Ganges, say 25 miles by 20 miles = 500 square miles.

"In this tract some of the finest wheat is grown, about 50 per cent. of the whole outturn of the district; the cultivators attempt to keep their seed pure white, but there is a tendency to revert to the red variety: the cultivators tell me that there is no market for red wheat, and that they endeavour to produce a pure white soft wheat without admixture of any kind, and sow it entirely by itself. Only a little linseed is sown round the margin of the field, and the whole *rubbee* cultivation in some villages in this tract is confined to wheat and linseed, with small patches of barley and other crops for home consumption. The wheat from this tract, although very good, is not equal to the wheat grown on the alluvium lands, and sells for one to two seers less in the rupee. The third principal cultivation of wheat is the koeries and others, amounting to about 5 per cent., who sow on dih* lands all over the district, one bigha or so at a time on rich dih land well manured and irrigated. This is probably as fine grain as could be produced in this district, and the only improvement that could be effected would be by sowing a better class of seed, which the koeries and others would be very glad to do; as it is they carefully select their seed and endeavour to get rid of all bad grains before sowing. There is a fourth source of wheat, viz. the small patches of wheat sown in good soil at the foot of the hills or in the valleys or local alluvium along the banks of the smaller streams; this does not amount to more than 5 per cent. of the wheat grown in the district, and is very variable in quality, a large proportion being red wheat in the south of the district. With regard to the question of increasing the cultivation, the whole of the deara lands could be sown year after year with wheat without any loss in quality, for the land is annually renewed by a rich deposit, and therefore the produce of this tract could be enormously increased, and no doubt the time will come when the value of a well-bred wheat crop, free from earthy particles or any other kind of grain, will be as well known to the wealthy cultivator of the deara as to the British farmer."

* Lands adjoining the village site.

Mr. Allen correctly remarks that the conditions of soil and climate most favourable for the production of the best wheat cannot be determined off-hand. Experiments are being made under the supervision of agricultural officers at

Dumraon and Arrah in Shahabad, Sripore in Sarun, in Wards' estates in Patna, in Bhagulpore, Monghyr, and elsewhere, in order to determine what species is best suited to the soil of these districts, what is the best method of cultivation, and by the application of what manures the largest outturn may be secured with the greatest economy. It will take some years before any of these questions can be positively answered. So far as our present knowledge extends, the soil and climate of Shahabad appear to be most favourable to the growth of the best grain, while Bhagulpore has the largest area under cultivation, but its grain is inferior in quality. Whether this inferiority is due to climatic and soil conditions it is not possible with our present limited knowledge to say for certain. Further experiment and observation will be made on this point. While the facts that red grain is so extensively grown, and that the white soft grain of Cawnpore has slightly deteriorated in Bhagulpore even in one year, appear *a priori* to indicate that the preference shown for red wheat by the cultivators of that division is not due to accident or ignorance, yet on the other hand the success which has attended the experimental cultivation of Buxar seed in Bhagulpore, and the results of the experiments made in the Patna Division described below, afford good grounds for the hope that much may be done in both the Patna and Bhagulpore Divisions towards increasing the yield, and in the former division especially towards improving the quality of the grain.

10. The results of experiments made by Mr. Allen on the experimental farm on the estate of the Maharajah of Doomraon in the Patna Division are described by that officer thus :—

"The grain from each of the fourteen plots was weighed in my presence, so the results given below may be considered as absolutely correct."

The first table shows the numbers and treatment of each plot.

Number.	Kind of wheat.	Treatment.	Remarks.
5A	Local	Deep-ploughed	With this wheat was sown a small amount of gram.
5B	Do.	Shallow	
10A	Dumraon prize... ...	Irrigated it from well	The well was old and the water probably rich in nitrates.
10B	Ditto	Ditto from canal	Worst soil on the farm.
11A	Mozaffernagur	Green soiled with hemp	These two plots were half a bigha each.
11B	Ditto	Unmanured	
12A	Ditto	Manured with ashes.	
12B	Ditto	Ditto ashes and saltpetre.	
12C	Local	Ditto cowdung	Good white wheat.
12D	Do.	Unmanured	Ditto.
12E	Buxar	Manured with saltpetre.	
12F	Do.	Unmanured.	
13A	Mozaffernagur	Ditto.	
13B	Local	Ditto	Good red wheat.

"The plots were arranged so as to make the comparison as fair as possible. Careful accounts were kept of the expenditure on each plot. Each plot (except 11A and 11B) measured exactly 1,600 square yards, or a standard bigha.

The following table gives the results of each plot :—

1	2	3
Number of plot.	Grain per acre.	Straw per acre.
	Mds. s. c.	Mds. s. c.
5A	16 7 0	25 29 0
5B	13 31 0	22 8 0
10A	14 3 0	16 38 0
10B	8 38 0	11 13 0
11A	27 6 0	36 38 0
11B	15 22 0	22 2 0
12A	20 4 0	22 8 0
12B	23 11 0	22 15 0
12C	18 19 0	22 17 0
12D	13 28 0	16 35 9
12E	27 10 0	62 31 0
12F	14 5 0	17 12 0
13A	15 13 0	12 33 0
13B	12 27 0	18 4 0

"The outturn in straw can only be taken as approximately correct owing to the native method of winnowing; but every care was taken to have the weight of straw ascertained with as much accuracy as possible.

"The following points are noteworthy:—

"Plots 5A and 5B show the advantage of deep ploughing which, it may be remembered, did not appear from the Arrah experiments. Besides the wheat, the former plot gave 39 and the latter 25 maunds of gram.

"Plots 10A and 10B apparently show that well-water is far superior to canal; but the result of this experiment is misleading. In the first place the well-water was unusually good, as it was full of organic matter, *e.g.* old leaves, &c., and then the soil on 10B plot is about the worst on the farm. It would be fairer to compare 10A with 12D, the plot sown with good white local wheat which was also canal irrigated. Here the advantage due to the well is reduced to 15 seers of grain per acre, while the outturn of straw is practically the same in both cases. The outturn from 11A is remarkably good, nearly equalling that from 12E, the best plot on the farm. The hemp was well ploughed in, and must have decomposed thoroughly in order to give so large a yield. It may be remembered that the plot at Arrah which was green soiled was also nearly equal to the saltpetre plot. The advantage of green soiling in this case amounts to nearly 12 maunds of grain and over 14 maunds of straw to the acre, which of course more than covers in the first year the cost of the treatment whose benefits will continue for at least three or four more croppings.

"Of the remaining plots, the following points may be noted:—There are four unmanured plots, viz. 12D, 12F, 13A and 13B. These four plots were sown respectively with local white, Buxar, Mozaffernagur, and local red wheat. Taking grain alone, the crops come in the following order:—(1) Mozaffernagur, (2) Buxar, (3) white, (4) red; but if we consider the straw only, the order is (1) red, (2) Buxar, (3) white, and (4) Mozaffernagur. The average outturn in grain from the unmanured plots may be taken as approximately equal to about 14 maunds to the acre. At Arrah the average was about 10½ maunds, but the land here is in a good season more suited for wheat than the lighter soil of the Arrah plots. Taking 14 maunds as the average, and disregarding for the present the difference due to the kind of grain used, we may note that the advantage per acre due to the use of ashes alone comes to six maunds, to the use of ashes and saltpetre nine maunds, to cowdung only four maunds, and to saltpetre alone over 13 maunds. In fact the outturn here is nearly doubled. I consider the yield from ashes and saltpetre on 12B, which should have given the best result, as abnormally low. *On the other hand, the outturn from 12E is simply astounding; 27¼ maunds of grain, which I found equal to 34¼ bushels to the acre, would be considered a very good crop on good soil in a good year in England, but here in India it is, I believe, unprecedented.* The outturn of straw over 60 maunds to the acre, or say 2¼ tons, is also very high, for it more than doubles the weight of grain, which is not usual with a good crop. As I saw and examined the grain weighed, there can be no doubt of the accuracy of the figures given above.

"I also took the weight of the different kinds of grains per bushel, which reached in some cases over 66lbs. In appearance the Mozaffernagur grain looked best, and I have carefully set apart the gram from the beardless ears in the hope of growing in time a beardless variety of wheat."

Mr. Hossein also made similar experiments with saltpetre as a manure in Bhagulpore, the results of which were not so satisfactory. They, however, also show that saltpetre applied at the rate of one and a half to two maunds per acre will give an increase of yield which more than pays the cost of the manure. Applied in excess of that quantity, saltpetre as a manure did not pay.

Mr. Allen applied crude saltpetre at the rate of 1½ maunds per acre, mixed with an equal weight of dry earth. The price of the crude saltpetre in Patna bazar was Rs. 3 per maund, or Rs. 4-8 per acre. The increased yield, due to the application of the manure, is 13 maunds valued at Rs. 30, thus showing a profit of Rs. 25-8 per acre. One year's experiments, it is true, *prove* nothing; but the results, so far as they go, are very encouraging, the outturn of Buxar wheat on a plot manured with crude saltpetre being, it will be observed, 34½ bushels per acre, which would be considered a very good crop on good soil in England. It may be here remarked that saltpetre is a forcing manure, and the continued application of it may lead to exhaustion of the soil; but, as Mr. Allen thinks, the exhausting effect will not be apparent for many years, and may be counteracted by green soiling once in five years. He accordingly advises the application of saltpetre as a top-dressing when the crop is a few inches high, followed by irrigation. Next to saltpetre, the best results were obtained from green soiling with hemp.

11. As to the effect of different soils in changing the colour of the grain, there appears to be no doubt that wheat brought from a distance will, under the influence of soil and climate, gradually change its character. The Committee of the Wheat and Trade Association report that the white Cawnpore wheat supplied to the Committee and introduced by Mr. Hossein into the Bhagulpore Division deteriorated in colour, and this result is in accordance with the general opinion of the cultivators in the wheat-producing tracts. In connection with

this point the Sub-divisional Officer of Barh reported in 1884 that the cultivators of that sub-division understood the superior value of white soft wheat, but it will only grow on certain soils, and if sown on the soil known as teliya kewal will, they alleged, turn to red. Dr. King, Superintendent of the Botanical Gardens, explained the fact, supposing the cultivators' opinion to be well-founded, by the theory that teliya kewal is more suitable for red than for white wheat, that the few seeds of the red sort that were mixed with the seed grain or remained in the field probably throve better than the white, and thus produced a larger proportion of seed. This process probably went on for a few years, when the major part of the crop became red, and the belief thus arose that the soil caused the white wheat to change to red. Mr. Macpherson, in reporting on the point, after enquiry in Nasrigunge, expresses the opinion that the degeneration of white wheat into red on certain soils is so universal that Dr. King's explanation will not suffice. Whatever the explanation may be, there can be no doubt of the fact that the white doodhya wheat which grows well on balsundar degenerates when grown continuously in kewal (stiff clay) soil. Experiment will be made in order to ascertain under what conditions the degeneration occurs, and how far it can be obviated by importation from time to time of fresh seed.

12. With reference to Messrs. Reinhold Brothers' scheme for the provision by Government of facilities for storing wheat near railway stations where the grain might be cleaned and graded on the American system, there is unanimity of opinion adverse to the proposal. I agree in the view that it is impracticable and inexpedient to establish grading warehouses in the manner suggested, and concur with the Director of the Agricultural Department of the North-Western Provinces in thinking that, if any such action as is suggested by Messrs. Reinhold Brothers is to be taken, it is precisely the kind of thing which ought to be done by private agency, and in which Government should not interfere unless the Chamber of Commerce find they are unable to insist on proper arrangements. In the present instance the Chamber are opposed to such interference, and no complaints are anywhere made of the insufficiency of the present storage accommodation at railway stations. The East Indian Railway authorities, it may be added, have recently reduced the freight rates from Patna, which now amounts to one-sixth of a pie per maund per mile. It will be seen, however, from the annexed list that while the freights from Patna have been reduced by more than twenty per cent. within the present year, no corresponding reduction has been made in freights from Doomraon and Buxar, from which stations local wheat should be largely exported.

13. On the question of forecasts, and the area sown, all the information which is available was given in my letter dated 2nd September, addressed to Agricultural Officers at Patna and Bhagulpore. These officers were requested to make an effort to supplement that information by enquiry conducted through sub-deputy collectors, canoongoes and patwaries on a system described in the following extract:—

"A statement is annexed to this letter showing the quantities of wheat carried by rail and boat from the principal stations and river marts in Behar and Bengal for the years 1877 to 1885.

"The figures for the rail-borne trade are taken from the railway returns and may be accepted as correct; but it is scarcely necessary to observe that they cannot be accepted as showing either the total quantities of wheat produced in the districts named, or the surplus produced in these districts over the requirements of total consumption. The quantities sent, for instance, by rail from Patna in 1883-84 was nearly thirteen lakhs of maunds, of which great part doubtless came by boat from Oudh, and part was locally produced; but how much came from other provinces, and how much may have been produced in the Patna and Chutia Nagpore Divisions, it is impossible to say. Mr. Allen, after communicating on the point with the Traffic Manager of the Bengal and North-Western Railway, as well as with the local merchants at Patna, may, it is hoped, be in a position to supply some information on this question. But whatever may be the facts of wheat production, the wheat traffic in Behar and the Lower Provinces of Bengal, as compared with that of other provinces, where more attention has been given to the subject, is, as will be seen from the annexed statement, by no means so insignificant as is ordinarily supposed. While the total imports of wheat to Calcutta in 1881-82 from all parts of India, including Bengal, amounted to only 107,86,269 maunds, the consignments from Behar and the Lower Provinces alone amounted to 56,71,080 maunds, or over 52 per cent. of the entire quantity.

"Another striking feature of these figures is the remarkable decline in the provincial trade since 1881-82, both absolutely and relatively to the quantity exported from

other provinces. It will be observed that, while the total exports from Bengal and Behar stations amounted in 1880-81 to over 51 lakhs of maunds, and in 1881-82 more than 56 lakhs, in 1882-83 they fell to 26 lakhs and in 1883-84 to 38 lakhs. As compared with the consignments from other provinces, the figures stand thus—

	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Percentage of Lower Provinces' consignments to Calcutta on total.	46	55	54	72	52	36	34	30

"The cause of this decline, both relatively to other provinces and abolutely, should be investigated.

"Coming now to the question of area under cultivation and forecasts, attention is invited to the statistics of cultivation given in the abstract of reports from Commissioners, annexed to the letter from the Financial Department of the Government of Bengal, to the Financial Department of the Government of India, No. 134½, dated 7th August 1883. It would appear from the figures given in that statement that the total area under wheat cultivation in Bengal and Behar is about 800,000 to 1,000,000 acres, or a sixth of the area under wheat in the North-Western Provinces, and half the area under wheat in Oudh. It must, however, be remembered that the figures showing cultivated areas in Bengal and Behar are merely estimates framed by the Collectors on the best data they could obtain no doubt, but still on every insufficient data. As Collectors in the Lower Provinces have no materials on which to form estimates of this kind, other than guesses made by themselves or their subordinates, it is evident that much confidence cannot be placed in such figured estimates of the area under wheat or any other crop. It is pointed out in the Government letter that much cannot be done in collecting accurate information regarding the area under cultivation, or in forming forecasts of the season's outturn, without a cadastral survey and an organised village agency. There is only one way in which, pending the carrying out of such a survey, it would appear that anything in this direction can be attempted, and that way is, through the agency of existing patwaries, who have been already registered in most of the Behar wheat-producing districts. It may be possible to obtain tolerably correct approximations to the true area under wheat in some selected districts in which patwaries have been registered, by issuing questions on the subject to them, through the Sub-divisional Officers, Sub-Deputy Collectors, and canoongoes. This suggestion cannot, however, be acted upon with any hope of successful results, except with the co-operation and support of the district authorities, and it is feared that the district staff is already so overburdened with work that district officers will not view with favour any proposal which will entail additional labour on any of their subordinates. A copy of this letter will, however, be sent to the Commissioner of the division to which you are attached, with whom you are requested to communicate on this point. If the Commissioner is of opinion that an attempt might be made to collect statistics of the area under wheat cultivation through the existing patwaries, and to issue forecasts of the probable outturn in the manner adopted in the North-Western Provinces, then the attempt to collect statistics of the normal area under cultivation may be taken in hand in one or two districts of the Patna and possibly also of the Bhagulpore Division.

"In that case the plan which would have to be adopted would be something of the following kind:—

You would first issue, though the Sub-Divisional Officer, the form annexed to be filled up by patwaries. The form might be delivered by the police to the village chowkidars, who in turn would make it over to the registered patwari to be filled up by the latter before a specified date. On that date all the patwaries within the thana jurisdiction would assemble at the police-station or other convenient centre, where you should yourself meet them with the Sub-Deputy Collector or canoongoe of the sub-division. You should then collect the forms, scrutinise them, demand explanations of manifest errors, correct mistakes arising from misconceptions of what is required, and then proceed to tabulate the results. There is little room for doubt that the patwaries can give the information asked for in this form with tolerable accuracy, notwithstanding their own protestations, or the assertions made with great positiveness to the contrary by persons who have, ordinarily, had very little practical experience of these matters. I have myself never yet met a patwari who could not give the area of up-lands (*bhit*) and of low-lands (*dhanhar*) in his village. His rent-roll being founded on the classification of village lands into up-lands and low-lands, to assert that he does not know the area of low-land and of up-land respectively is ordinarily to assert that he has no rent-roll, and that there is no basis whatever on which the amounts of rents are determined and collected in his village. What the patwarie's papers will not show is the portion of the up-land which is ordinarily under any particular crop. But admitting this difficulty to exist, yet the patwari can estimate with close approximation to truth the area under any particular crop in his village. His estimate, it is true, is only a guess; but then it is the guess of a man dealing with a very limited area, in which he may have spent his life, on a subject with which he is intimately acquainted; and so far it would appear to be more likely to be correct than the guess of a Government official dealing with a large and indefinite area, of which he may

not have had much personal knowledge, on a subject to which he may have given no particular attention, and as to which the more he gives it special attention, the more he probably finds that his guesses are and must, from the nature of the case, be exceedingly wide of the mark. That the putwaries can give the areas under each crop with tolerable accuracy I have no doubt: that they will do so, or that the objects of such inquiries will not be misunderstood or misrepresented, is another question.

14. It was found, however, impossible to collect statistics in the Bhagulpore Division in the manner suggested, because patwaries have not there been registered; and although it would be possible to get tolerably accurate statistics in the Patna Division, where the registration of patwaries has been more or less completed, yet it was found necessary, for the present, to abandon the attempt to do so, because the services of canoongoes and sub-deputy collectors could not be spared for the purpose, and the Commissioner thought that the employment of these officers on this work would lead to complications with district officers. It was at the same time obviously impossible for Mr. Allen to collect such statistics himself, and, if it were possible, his employment on work of this kind would involve waste of power for which statistics, such as he could collect, would not yield adequate compensation. I regret that I am not, therefore, at present able to give more accurate figures of the area under cultivation than have already been furnished by Collectors. These figures, as frequently remarked, are mere guesses, and are of little value. The failure of the attempt to collect accurate statistics of the comparatively small area cultivated under wheat in Bengal, in the way suggested, affords another illustration of the difficulties attendant on all efforts in this direction in these provinces, unless and until an agency is created for the purpose, or the existing agency is put on a very different footing from that on which it now rests. The area under cultivation in each district, as estimated by Collectors, with abstracts of the imports and export to and from Calcutta, as ascertained from the Custom House and railway returns, are given in an appendix. Speaking broadly, it may be said that the cultivation of wheat on a considerable scale is confined to the Shahabad district of the Patna Division, to the Monghyr and Bhagulpore and parts of the Purneah and Maldah districts of the Bhagulpore Division, and to the Nuddea and Moorshedabad districts of the Presidency Division.

15. Adverting to the subject of forecasts, it will be gathered from the preceding remarks that as in the case of jute so in the case of wheat also, it is not possible at present to give trustworthy statistics of the area under cultivation. Still less is it possible to give trustworthy forecasts of the area cultivated from year to year. But as pointed out in my letter No. 321, dated 20th March 1886, on the subject of jute forecasts, it is possible to give forecasts founded on information collected from selected zemindars, European planters, Managers of Wards' and Government estates and others, showing whether more or less than the normal area, whatever that area may be, is under cultivation each year, and whether the prospects of the crop at the various stages of its growth are better or worse than usual. I propose to have forecasts of the wheat crop prepared on this system for the crop to be sown next cold-weather, if the Agricultural Department is permitted to continue in existence till that time.

16. I have communicated with the Punjab Commissioner of Settlements and Agriculture on the question of the publication of a broad sheet, and the dissemination of information on the best method of cultivation in the manner proposed in that province. It has been ascertained, however, that the proposed broad sheets have not yet been prepared, but when they are ready the Commissioner has promised to favour me with copies which can be distributed if found suited to the conditions of cultivation in those provinces.

Meanwhile, I do not think, with the meagre knowledge and limited experience of these things acquired in Bengal, that we should be warranted in dogmatically laying down any instructions for cultivators. When, after careful experiment and extended observation, more knowledge and experience have been acquired on the subject, we may be able to do so. All that can be safely done in the interim is, to circulate in the mofussil the Calcutta trade price-lists showing the prices of the different species of wheat, and therefore their relative market values; to exhibit also samples of the different grains with their prices annexed, in economic museums, at the offices of Managers of Wards' and Government estates, and in other places where the cultivators might have

access to them, so that cultivators may see for themselves the kinds which fetch the highest prices; and finally to distribute selected seed and encourage the cultivation of the better kinds of grain in Government and Wards' estates to begin with, and afterwards in other estates also. All this and more in the same direction might be done by the Agricultural Department if established on a permanent basis; but hampered as this Department now is by the provisional nature of the sanction on which it rests, the tenuity of the funds and the paucity of the agency at its disposal, it is difficult to take any action in this or other matters involving arrangements of a permanent nature. Therefore it is that we have been obliged during the past year to confine ourselves almost entirely to enquiry and experiment.

17. Prizes were also given to cultivators who exhibited the best specimens of grain at the Agricultural Exhibition held at Doomraon in 1885. Mr. Peppe's report attests the eagerness with which the ryots present at that exhibition asked for samples of the best varieties, and I can myself also vouch for the spirit of rivalry aroused among them; for on the recurrence of a similar exhibition in the same neighbourhood in February last, some cultivators who had obtained prizes at the previous exhibition, but failed to do so at the latter, protested against the awards of the judges and complained that the grain exhibited by them was as good as that for which they had received prizes the previous year. If these exhibitions and prizes are continued, and the cultivation of the better kinds of grain is thus fostered in Shahabad, the district which in this and other respects has taken the lead of all others in attempts at agricultural improvement, it may be possible to get cultivators on the Government estates there to grow *pedigree* wheat for seed alone.

I have the honour to be,

SIR,

Your most obedient servant,

M. FINUCANE,

Director of the Agricultural Department, Bengal.

APPENDIX A.

Statement showing the imports of wheat into Calcutta, province by province, during the years from 1877-78 *to* 1884-85.

Names of Provinces.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
North-Western Provinces and Oudh	31,38,034	11,03,382	14,92,312	18,90,523	45,89,877	43,33,111	70,47,837	30,81,031
Behar	20,03,787	9,83,645	16,09,729	39,75,726	47,25,218	22,42,249	33,54,234	9,91,048
Bengal	13,24,776	4,70,773	4,37,995	12,13,750	9,45,862	4,86,698	5,68,100	4,58,676
Punjab	6,18,630	87,933	2,52,654	34,110	4,50,725	2,40,062	2,11,384	1,17,681
Central Provinces	29,526	.....	11	147	58,146	2,587	22,227	31,187
Other places	14,724	950	813	3,942	16,441	33,356	8,304	17,516
Total ...	71,30,477	26,46,683	37,93,514	71,18,198	1,07,86,269	73,08,081	1,12,12,096	46,97,130
Percentage of Behar and Bengal imports on total	46	55	54	72	52	36	34	30

Statement showing the principal districts in the North-Western Provinces and Oudh, which despatched wheat largely to Calcutta during the years from 1877-78 *to* 1884-85.

Names of Districts.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Fyzabad	1,56,039	293	22,138	1,43,282	7,39,287	5,40,970	7,30,116	1,17,504
Shahjehanpore	1,72,275	1,52,741	1,06,160	1,81,220	2,25,816	1,08,109	7,17,841	1,39,697
Lucknow	2,04,827	10,828	74,957	1,40,091	3,52,301	3,07,418	6,75,567	5,24,606
Bara Banki	35,901	503	726	12,146	1,56,429	3,53,747	6,40,369	5,17,851
Hardui	79,997	10,070	41,525	70,886	3,46,125	3,68,951	5,46,201	4,77,106
Benares	1,75,163	11,015	70,126	1,11,086	2,91,277	1,93,219	5,01,775	1,45,999
Bulandshahr	88,944	23,070	1,47,756	26,655	2,00,377	1,26,704	4,46,492	1,49,809
Allyghur	2,15,423	35,979	2,43,666	1,00,864	1,91,243	2,27,052	4,38,557	2,46,117
Mozuffernuggur	1,33,691	3,052	37,608	4,513	1,32,680	3,44,813	4,06,221	2,82,794
Meerut	2,62,695	35,208	1,97,728	50,843	3,68,372	1,81,029	3,73,960	1,20,571
Moradabad	1,33,381	96,251	50,462	1,11,585	2,07,438	1,12,805	3,59,732	16,800
Cawnpore	8,37,052	5,45,726	2,78,453	4,24,285	8,52,382	4,60,437	3,22,857	1,35,091
Bareilly	85,578	44,290	8,432	1,09,970	1,18,662	32,098	1,11,069	1,895
Allahabad	55,856	1,538	37,268	1,01,327	51,524	1,34,530	96,074	11,406
Goruckpore	31,734	.....	82,666	2,06,390	1,37,358	49,701	93,100	31,576
Other districts	4,69,578	1,32,818	92,641	95,380	2,18,608	7,90,928	5,89,408	2,02,290
Total ...	31,38,034	11,03,382	14,92,312	18,90,523	45,89,877	43,33,111	70,47,837	30,81,031

Statement showing the principal districts in Behar from which Calcutta imported wheat during the years from 1877-78 *to* 1884-85.

Names of Districts.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Patna	4,91,620	88,943	5,27,913	15,32,798	21,03,801	10,48,866	14,19,002	1,77,647
Shahabad	1,68,015	30,591	76,685	1,08,911	6,74,247	1,94,337	8,18,785	3,56,823
Bhagulpore	6,05,653	3,87,248	3,92,361	7,75,122	5,98,979	2,52,157	2,90,333	1,12,004
Monghyr	3,69,079	1,65,973	2,04,825	5,69,504	5,24,112	2,37,188	2,56,020	47,876
Sontal Pergunnahs	98,580	1,01,702	1,32,067	3,38,754	2,85,059	2,66,343	2,35,483	1,54,691
Gya	.....	.....	.....	32,278	36,597	44,883	1,02,768	.....
Maldah	92,405	72,457	48,280	1,30,828	1,25,040	58,570	80,039	79,339
Sarun	1,16,821	1,44,605	1,87,274	3,70,197	2,97,020	93,555	70,910	38,396
Other districts	1,54,019	64,583	40,320	1,17,334	80,363	56,350	80,944	24,273
Total ...	20,03,787	9,83,645	16,09,729	39,75,726	47,25,218	22,42,249	33,54,234	9,91,048

Statement showing the principal Railway Stations from which Calcutta imported wheat during the years from 1877-78 *to* 1884-85.

Stations.	Districts.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
		Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Patna	Patna	2,32,000	20,208	3,96,913	12,53,261	18,27,700	9,44,121	12,99,925	1,29,417
Lucknow	Lucknow	1,43,018	4,820	59,339	1,16,792	2,75,656	2,22,677	5,65,036	3,13,161
Shahjehanpore	Shahjehanpore	1,65,100	1,34,433	1,00,655	1,70,976	1,91,354	78,696	5,09,561	72,600
Fyzabad	Fyzabad	1,04,245	293	2,682	47,422	5,27,536	3,38,920	4,69,222	27,925
Hurdui	Hurdui	63,905	9,053	22,367	30,372	2,43,713	2,03,455	3,40,207	2,96,571
Meerut	Meerut	1,52,200	35,208	1,64,402	47,392	1,10,070	1,31,584	3,38,766	71,972
Cawnpore	Cawnpore	8,30,800	5,39,810	2,69,273	4,23,832	8,52,382	4,59,885	3,22,857	1,35,091
Chandowsi...	Moradabad...	1,14,000	93,638	48,522	1,06,814	1,62,921	1,07,061	3,10,036	16,260
Allyghur	Allyghur	91,700	28,908	1,95,040	91,499	1,72,544	1,36,213	2,99,660	1,76,036
Buxar	Shahabad	35,210	4,838	28,201	30,057	2,19,830	37,385	2,82,347	91,349
Koorjah	Bulandshahr	41,462	10,307	92,815	14,418	1,11,764	57,270	2,48,103	92,319
Arrah	Shahabad	43,324	12,238	8,889	12,989	1,93,098	61,960	2,06,572	68,525
Zumoueah	Benares	47,654	7,104	37,123	49,956	1,69,995	1,07,360	1,95,658	94,311
Benares	Benares	58,929	.....	4,477	12,518	1,336	3,307	1,78,392	1,581
Delhi	Delhi	2,41,400	79,304	2,54,812	34,110	4,49,670	2,06,973	1,76,135	1,17,072
Sahebgunge	Sonthal Pergunnahs ...	35,480	35,265	70,537	2,41,888	1,73,959	1,57,260	1,48,424	36,739
Sukuldeah...	Benares	16,402	819	15,947	33,939	96,369	58,853	84,745	30,876
Bhagulpore	Bhagulpore	36,007	21,039	23,802	90,076	77,115	33,848	54,387	2,737
Barrh	Patna	51,161	763	508	22,021	1,47,527	47,550	42,764	.....
Monghyr	Monghyr	38,837	11,121	22,318	90,490	1,47,453	36,005	29,768	1,334
Bareilly	Bareilly	.....	36,187	.....	76,255	75,628	25,100	34,781	.....
Gazeabad	Meerut	1,04,622	.....	29,228	2,944	2,45,353	21,530	19,066	10,145
Chowsa	Shahabad	16,010	4,617	26,412	14,198	1,11,595	60,687	2,03,575	1,10,279

Statement showing the principal river marts which exported wheat to Calcutta during the years 1877-78 *to* 1884-85.

Marts.	Districts.	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
		Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Bhuddressur ...	Hooghly	93,900	69,141	1,12,020	2,08,560	2,00,306	94,533	1,59,230	51,878
Nuddea ...	Nuddea	.....	1,01,288	98,251	3,09,406	1,91,157	1,05,442	1,14,394	1,61,838
Monghyr ...	Monghyr ...	78,400	1,09,202	1,54,954	3,10,874	1,99,772	1,02,686	1,13,299	27,159
Bhagulpore ...	Bhagulpore ...	1,16,900	3,20,730	3,08,388	4,84,912	3,97,530	1,27,364	1,09,969	79,406
Goruckpore ...	Goruckpore ...	.....	.....	61,975	1,19,959	69,922	42,743	59,487	30,031
Maldah ...	Maldah	43,500	71,407	47,990	1,30,277	1,24,903	59,570	77,389	77,874
Patna ...	Patna	1,50,300	67,024	1,26,285	1,97,395	95,530	50,819	63,406	45,643
Moorshedabad ..	Moorshedabad ...	50,500	56,831	29,616	1,32,431	88,062	44,067	50,670	69,789
Kevelgunge ...	Sarun	1,11,323	89,171	1,20,253	2,38,833	2,66,617	48,941	39,004	20,682
Chuprah ...	Sarun	.....	55,434	66,038	1,30,153	30,403	44,614	31,906	17,714
Fyzabad ...	Fyzabad	.....	.....	18,941	87,231	41,191	2,898	22,363	13,743
Hanskhally ...	Nuddea	58,344	11,351	38,334	61,452	48,747	12,641	15,648	11,958

Statement showing area under wheat in each district as estimated by Collectors.

PATNA DIVISION.

	Acres.
Patna	200,000
Gya	82,300
Shahabad	200,000
Durbhunga	12,200
Sarun	95,000
Chumparun	89,000
Total ..	678,500

BHAGULPORE.

Monghyr	107,200
Bhagulpore	162,000
Purneah	27,600
Maldah	3,300
Sonthal Pergunnahs	8,500
Total ..	303,600

BURDWAN DIVISION.

Burdwan	1,340
Bankoora	2,000
Beerbhoom	710
Midnapore	600
Hooghly	59
Total ..	4,709

CHOTA NAGPORE.

Hazaribagh	1,500

ORISSA DIVISION.

Cuttack	500
Balasore	600
Total ..	1,100
GRAND TOTAL ..	989,409

Railway rate for carriage per 100 *maunds of wheat from the following stations to Howrah during June of* 1886, 1885, 1884 *and* 1883.

From.	1886.			1885.			1884.			1883.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Mananpur ...	27	5	0	28	0	0	27	0	0	28	0	0
Luckeeserai ...	26	5	0	29	0	0	28	0	0	29	0	0
Burhee ...	24	5	0	29	0	0	28	0	0	29	0	0
Makamch ...	22	5	0	30	0	0	28	0	0	30	0	0
Ditto ghât ...	22	5	0	30	0	0	28	0	0	30	0	0
Barh ...	25	5	0	32	0	0	30	0	0	32	0	0
Bukhtiarpur ...	27	5	0	33	0	0	31	0	0	33	0	0
Khusrupur ...	29	0	0	33	0	0	31	0	0	33	0	0
Futwah ...	29	0	0	34	0	0	31	0	0	34	0	0
Patna ...	27	0	0	34	0	0	31	0	0	34	0	0
Bankipore ...	29	0	0	35	0	0	35	0	0	35	0	0
Digha ghât ...	27	0	0	.....			.....			.....		
Poonpoon ...	30	0	0	36	0	0	34	0	0	36	0	0
Masaurhi ...	31	0	0	36	0	0	34	0	0	36	0	0
Jehanabad ...	33	0	0	37	0	0	35	0	0	37	0	0
Makhdumpur ...	35	0	0	38	0	0	36	0	0	38	0	0
Bela ...	36	0	0	39	0	0	37	0	0	39	0	0
Chakand ...	37	0	0	39	0	0	37	0	0	39	0	0
Gya ...	38	0	0	40	0	0	38	0	0	40	0	0
Dinapore ...	29	0	0	35	0	0	33	0	0	35	0	0
Bihta ...	31	0	0	36	0	0	34	0	0	36	0	0
Arrah ...	33	0	0	37	0	0	35	0	0	37	0	0
Beehea ...	36	0	0	39	0	0	37	0	0	39	0	0
Raghunathpur ...	37	0	0	39	0	0	37	0	0	39	0	0
Dumraon ...	39	0	0	40	0	0	38	0	0	40	0	0
Buxar ...	41	0	0	41	0	0	39	0	0	41	0	0

Rate per 100 *maunds for wheat and other grain from the undermentioned stations to Howrah.*

Stations from.	1885.						1886.											
	January to August.			September and October.			November and December.			January.			February.			March.			April.			May.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Burdwan ...	10	0	0	10	0	0	10	0	0	10	0	0	10	0	0	10	0	0	10	0	0	10	0	0
Bhagulpore ...	28	0	0	26	0	0	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0	28	0	0
Mokameh Ghât...	30	0	0	28	0	0	30	0	0	30	0	0	30	0	0	22	5	0	22	5	0	22	5	0
Patna ...	34	0	0	31	0	0	34	0	0	34	0	0	27	0	0	27	0	0	27	0	0	27	0	0
Digha Ghât* ...	.....			33	0	0	35	0	0	35	0	0	27	0	0	27	0	0	27	0	0	27	0	0
Mirzapur ...	48	0	0	45	0	0	48	0	0	48	0	0	48	0	0	48	0	0	48	0	0	48	0	0
Allahabad ...	52	0	0	52	0	0	52	0	0	52	0	0	52	0	0	52	0	0	52	0	0	52	0	0
Jubbulpore ...	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0
Cawnpore ...	53	0	0	53	0	0	53	0	0	53	0	0	53	0	0	53	0	0	53	0	0	53	0	0
Agra ...	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	55	0	0
Hathras ...	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	55	0	0
Aligarh ...	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0
Ghaziabad ...	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	53	0	0
Delhi ...	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	60	0	0	53	0	0

* This station was opened in July 1885.

Nos. 414-16, dated Calcutta, the 2nd September 1885.

From—M. Finucane, Esq., Director of the Agricultural Dept., Bengal,

To—D. B. Allen, Esq., c.s.; to Ambica Churn Sen, Esq., c.s.; to Sukhawat Hossein, Esq.

I have the honour to forward, for your information and careful consideration, the papers noted in the margin on the subject of wheat cultivation and trade in India, on which Government has called for the submission of a report by the end of November.

Letter No. 1439—116 Agricultural, dated the 25th July, and enclosures, form the Revenue Department of the Government of Bengal.

1. The first question to which attention is called is the necessity of obtaining clean grain for export. It will be seen from the papers that the mixture of foreign matter in the wheat now sent to Calcutta for export is said seriously to depreciate its price, thus affecting unfavourably India's ability to compete successfully with America, Australia, and other countries, and ultimately injuring the producers. The impure condition of Indian as compared with the wheat of other countries, is attributed to one or more of the three following causes :—

1*st*.—The mixture of other grains due to the practice of growing two or more crops on the same land at the same time.

2nd.—Imperfect arrangements for winnowing the grain and removal of extraneous matter.

3rd.—Deliberate adulteration by traders, brokers, or others.

2. As regards the first of the causes enumerated above, it will be observed that the Bengal Government in circulating among Commissioners the letter from the Government of India No. 57A, dated 10th August 1883, with Mr. Bolton's Circular No. 7T—R, dated 4th September 1883, desired these officers to issue instructions to Collectors of wheat-producing districts, in accordance with the wishes of the Government of India, to impress on wheat growers the importance of preventing the admixture of other grains with wheat, and at the same time called upon them to report the action which Collectors might take in the matter. The Commissioners generally reported, in reply, that little could be done in the matter, and added that all that was possible would be done in making known to the cultivators the importance of keeping their wheat free from foreign substances. The Assistant Commissioner of Palamow went further than this, and promised that he would endeavour to persuade cultivators to sow their wheat by itself in the course of his next cold-weather tour, while the Commissioner of Patna submitted for the approval of Government a draft circular which he proposed to issue to zemindars, putwaries, and others, pointing out to them the disadvantage of growing wheat in the same fields as other grains. Attention has, however, been called since that time to the circumstance that the cultivator, in growing oilseeds or other crops with wheat, selects such crops as are likely to succeed in a drought when wheat fails, and thus protects himself against the risks of an unfavourable season. Bengal wheat contains a large admixture of linseed, stones and mud. The standard of refraction in Calcutta being 5 per cent., any refraction there may be over and above this standard is deducted from the value of the parcel. If, for example, the refraction is 8 per cent., a deduction is made of 3 per cent.; but it is remembered, on the other hand, that as 5 per cent. is ordinarily deducted, it is doubtful whether cultivators would, under existing arrangements, derive any benefit from the production of entirely clean grain, or grain in which there may be less than 5 per cent. of foreign matter. It is found in the trade that mud can be got rid of, but there is no process known by which linseed or barley can be separated from the wheat, and hence it happens that parcels containing an admixture of mud sell better in the London market than parcels containing an equal weight of admixture of other grains. It is to avoid this admixture that merchants agitate against the simultaneous growth of two or more crops with wheat in the same field.

2 (*a*). The advantage of producing clean wheat would, as a matter of course, be represented by the smaller refraction of say 2 per cent. which might be charged on pure wheat, if it could be generally procured, instead of the ordinary refraction of 7 to 10 per cent.; but it is yet to be shown that any appreciable part of this advantage would reach the cultivator as long as a uniform minimum standard of refraction is adopted by the exporters in Calcutta. That, then, the growth of other crops simultaneously with wheat in the same fields is, under all circumstances, to be deprecated does not appear to be a conclusion so obviously certain *a priori*, or so firmly established by the results of experience, as to warrant, for the present at all events, the active interference of Government officers in discountenancing the practice. In the present state of our knowledge on the subject, all that seems desirable to do would appear to be to point out to the cultivator the advantages, such as they are, of producing clean wheat, and of separating the hard and soft and the white and red grains in the selection of seed, and to leave it to him to determine whether the reasons for growing a mixed crop are outweighed by the reasons for growing it alone. The question, however, is one which demands further enquiry, and I request that you will give it your attention and report upon it in due time.

3. With reference to the second cause given for the impurity of Indian wheat, namely the defectiveness of existing arrangements for winnowing, I would invite your attention to the remarks made in paragraph 5 of the proceedings of the Punjab Government. It is there stated that the suggestion has been made that it might not perhaps be beyond the "ryot's "means to thresh his wheat on a wood, canvas, or matting floor, and that a common fan "would be far more efficacious than winnowing the grain by exposing it to the action of the "wind by pouring it out of a basket or tray."

4. The Punjab Government is, however, of opinion that little in this direction can be expected from the cultivators, and it looks mainly to the traders to provide cleaning or winnowing machines. It appears certain that nothing can be hoped for, in this matter, from ordinary cultivators, at least until it can be clearly shown them that they would derive any adequate advantage from the production of entirely clean grain. The fact would seem to be that the impurity of Indian wheat is due to deliberate adulteration by brokers and traders as much as to admixture of foreign grains or imperfect winnowing on the part of the cultivators. If, however, anything is to be done in the direction of introducing better arrangements for cleaning the grain by winnowing machines or otherwise, the agency through whom the attempt must be made is that of zemindars, village headmen, or the grain-dealers themselves.

5. The next question to which attention is called is the improvement of the species of wheat grown. On this point the remarks made in paragraph 6 of the proceedings of the Punjab Government deserve careful consideration.

The different species of wheat now grown in Bengal are described, so far as information is available, in the abstract appended to the Bengal Government letter No. 1020F of the

20th July 1882, of which a copy is annexed. It has been ascertained from wheat merchants of Calcutta that the kinds exported from the Calcutta port are—

No. 1 club, containing 75 per cent. of white and 25 of red, with a bold grain.
" 2 " " 65 " " 25 of red.
" 3 hard red.
" 4 soft "

6. Buxar sends No. 1 club, a very superior soft white wheat, the only grain in these parts which can compete with the No. 1 club of Delhi; Bhagulpore sends hard red and soft red; while Eastern Bengal chiefly sends soft red—a very inferior grain.* It is not quite certain whether the Buxar No. 1 club is so called because it is grown in the neighbourhood of that place, or because it is consigned to Calcutta from Buxar, though produced elsewhere; nor is it known to what extent this grain is grown in Shahabad or other districts of Behar, what are the conditions of soil and climate most favourable to its production, nor how far the cultivation of it might, with advantage, be extended to other districts. These are points on which Mr. Allen, the special officer of the Patna Division, is requested to make careful enquiry in communication with the agricultural officers of other divisions, and to report the results to this office. Samples of the different kinds of wheat named above will be forwarded for examination and comparison with the grain locally produced.

* Report of Collector of Customs, 1883-84.

A statement showing the prices commanded in Calcutta, at present, by each of these grains will also be forwarded to you, so that you may be in a position to judge for yourself, and to explain to the cultivators the relative merits of these several kinds *inter se* and as compared with the grain locally produced.

7. In paragraph 4 of the letter from the Bengal Government and paragraph 11 of the Resolution of the Punjab Government is discussed a proposal made by Messrs. Reinhold of Cawnpore to establish a system of inspecting and grading wheat similar to that adopted in America. The proposal does not receive, it is believed, much favour from the Calcutta Chamber of Commerce, but the question of the establishment of such a system in Patna, from which some 13 lakhs of maunds are sent annually by rail to Calcutta—a quantity which is more than double that consigned from Cawnpore or any other station in India—is one on which Mr. Allen is requested to report fully, after communication with persons interested in the wheat trade in Patna. The special officer of the Bhagulpore Division should make similar enquiries regarding the expediency or otherwise of establishing a similar system in Bhagulpore or Monghyr, from which large quantities are sent by boat. In connection with this subject agricultural officers are requested to enquire into the sufficiency of the existing accommodation for storage of wheat at or near railway stations; to what extent, if any, inconvenience or loss is now caused by the insufficiency of such accommodation; whether it is necessary or desirable to establish warehouses in the way suggested, near railway stations, or in the gunges or marts by the river-side, whence the wheat is shipped, and if so, whether it would be feasible to make arrangements for cleaning the grain stored in such warehouses.

8. As regards the question of agricultural forecasts, the encouragement of good cultivation, and the communication of instructions to cultivators, it is well known that no trustworthy information regarding the area under wheat cultivation in the Lower Provinces is now available, and it will be seen that the Lieutenant-Governor fears that we shall not be in a position to prosecute enquiries into this branch of the subject with reasonable hopes of success till village establishments are organized. His Honour desires, however, that the Agricultural Department should endeavour to collect accurate knowledge on the subject and to disseminate any information which may be of practical use. The questions of the improvement of cultivation and of increase in the outturn per acre by the use of artificial manure or otherwise are, it is believed, already engaging your attention in accordance with existing instructions, and they need not be further considered here.

9. A statement is annexed to this letter showing the quantities of wheat carried by rail and boat from the principal stations and river marts in Behar and Bengal for the years 1877 to 1885.

The figures for the rail-borne trade are taken from the railway returns and may be accepted as correct; but it is scarcely necessary to observe that they cannot be accepted as showing either the total quantities of wheat produced in the districts named, or the surplus produced in these districts over the requirements of local consumption. The quantities sent, for instance, by rail from Patna in 1883-84 was nearly thirteen lakhs of maunds, of which great part doubtless came by boat from Oudh, and part was locally produced; but how much came from other provinces, and how much may have been produced in the Patna and Chutia Nagpore Divisions, it is impossible to say. Mr. Allen, after communicating on the point with the Traffic Manager of the Bengal and North-Western Railway, as well as with the local merchants at Patna, may, it is hoped, be in a position to supply some information on this question. But whatever may be the facts of wheat production, the wheat traffic in Behar and the Lower Provinces of Bengal, as compared with that of other provinces, where more attention has been given to the subject, is, as will be seen from the annexed statement, by no means so insignificant as is ordinarily supposed. While the total imports of wheat to Calcutta in 1881-82 from all parts of India, including Bengal, amounted to only 107,86,269 maunds, the consignments from Behar and the Lower Provinces alone amounted to 56,71,080 maunds, or over 52 per cent. of the entire quantity.

10. Another striking feature of these figure is the remarkable decline in the provincial trade since 1881-82, both absolutely and relatively to the quantity exported from other provinces. It will be observed that, while the total exports from Bengal and Behar stations amounted in 1880-81 to over 51 lakhs of maunds and in 1881-82 more than 56 lakhs, in 1882-83 they fell to 26 lakhs and in 1883-84 to 38 lakhs. As compared with the consignments from other provinces, the figures stand thus :—

	1877-78.	1878-79.	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
Percentage of Lower Provinces' consignments to Calcutta on total.	46	55	54	72	52	36	34	30

The cause of this decline, both relatively to other provinces and absolutely, should be investigated.

11. Coming now to the question of area under cultivation and forecasts, attention is invited to the statistics of cultivation given in the abstract of reports from Commissioners, annexed to the letter from the Financial Department of the Government of Bengal, to the Financial Department of the Government of India, No. 134½, dated 7th August 1883. It would appear from the figures given in that statement that the total area under wheat cultivation in Bengal and Behar is about 800,000 to 1,000,000 acres, or a sixth of the area under wheat in the North-Western Provinces, and half the area under wheat in Oudh. It must, however, be remembered that the figures showing cultivated areas in Bengal and Behar are merely estimates framed by the Collectors on the best data they could obtain no doubt, but still on very insufficient data. As Collectors in the Lower Provinces have no materials on which to form estimates of this kind, other than guesses made by themselves or their subordinates, it is evident that much confidence cannot be placed in such figured estimates of the area under wheat or any other crop. It is pointed out in the Government letter that much cannot be done in collecting accurate information regarding the area under cultivation, or in forming forecasts of the season's outturn, without a cadastral survey and an organised village agency. There is only one way in which, pending the carrying out of such a survey, it would appear that anything in this direction can be attempted, and that way is, through the agency of existing patwaries, who have been already registered in most of the Behar wheat-producing districts. It may be possible to obtain tolerably correct approximations to the true area under wheat in some selected districts in which patwaries have been registered, by issuing questions on the subject to them, through the Sub-Divisional Officers, Sub-Deputy Collectors, and canoongoes. This suggestion cannot, however, be acted upon with any hope of successful results, except with the co-operation and support of the district authorities, and it is feared that the district staff is already so overburdened with work that district officers will not view with favour any proposal which will entail additional labour on any of their subordinates. A copy of this letter will, however, be sent to the Commissioner of the division to which you are attached, with whom you are requested to communicate on this point. If the Commissioner is of opinion that an attempt might be made to collect statistics of the area under wheat cultivation through the existing patwaries, and to issue forecasts of the probable outturn in the manner adopted in the North-Western Provinces, then the attempt to collect statistics of the normal area under cultivation may be taken in hand in one or two districts of the Patna, and possibly also of the Bhagulpore Division.

12. In that case the plan which would have to be adopted would be something of the following kind :—

You would first issue, through the Sub-Divisional Officer, the form annexed to be filled up by patwaries. The form might be delivered by the police to the village chowkidars, who in turn would make it over to the registered patwari to be filled up by the latter before a specified date. On that date all the patwaries within the thana jurisdiction would assemble at the police station, or other convenient centre, where you should yourself meet them with the Sub-Deputy Collector or canoongoe of the sub-division. You should then collect the forms, scrutinise them, demand explanations of manifest errors, correct mistakes arising from misconceptions of what is required, and then proceed to tabulate the results. There is little room for doubt that the patwaries can give the information asked for in this form with tolerable accuracy, notwithstanding their own protestations, or the assertions made with great positiveness to the contrary by persons who have, ordinarily, had very little practical experience of these matters. I have myself never yet met a patwari who could not give the area of up-lands (*bhit*) and of low-lands (*dhanhar*) in his village. His rent-roll being founded on the classification of village lands into up-lands and low-lands, to assert that he does not know the area of low-land and of up-land respectively is ordinarily to assert that he has no rent-roll, and that there is no basis whatever on which the amounts of rents are determined and collected in his village. What the patwarie's papers will not show is the portion of the up-land which is ordinarily under any particular crop. But admitting this difficulty to exist, yet the patwari can estimate with close approximation to truth the area under any particular crop in his village. His estimate, it is true, is only a guess; but then it is the guess of a man dealing with a very limited area, in which he may have spent his life, on a

subject with which he is intimately acquainted; and so far it would appear to be more likely to be correct than the guess of a Government official dealing with a very large and indefinite area, of which he may not have had much personal knowledge, on a subject to which he may have given no particular attention, and as to which the more he gives it special attention, the more he probably finds that his guesses are and must, from the nature of the case, be exceedingly wide of the mark. That the patwaries can give the areas under each crop with tolerable accuracy I have no doubt: that they will do so, or that the objects of such inquiries will not be misunderstood or misrepresented, is another question.

13. If any attempt is to be made to collect more accurate statistics than we now possess of the area under wheat cultivation in the manner suggested, it will probably be advisable to confine our efforts, at first at all events, to the Patna and Shahabad districts in the Patna Division, and to the Monghyr and Bhagulpore districts in the Bhagulpore Division, as these seem to be the principal wheat-growing districts. It is needless to remark that, if any such enquiries as are here indicated are to be undertaken, they should not be confined to wheat, but should include the other principal crops also.

14. The Calcutta Chamber of Commerce will be asked, and it has been ascertained are willing to furnish, monthly statements showing the prices ruling in London and Calcutta for the various kinds of wheat, together with samples of the grains themselves. These statements, if translated into the vernacular and widely published in the wheat-producing tracts, would, it is anticipated, effect more in the direction of inducing cultivators to produce, in their own interests, clean grain of superior quality than instructions, advice or prizes given by Government officers.

The Government of the Punjab will be requested to supply copies of the broad sheets referred to in the correspondence, which will be forwarded to you in due course.

Nos. 417-25.

COPY forwarded to all Commissioners of Divisions for information.

No. 426.

COPY forwarded to the Secretary, Bengal Chamber of Commerce, for the favour of an expression of the Chamber's opinion on the questions discussed in the letter, with special reference to paragraphs 2, 7 and 13.

By his most obedient servant,

M. FINUCANE,

Director of the Agricultural Department, Bengal.

CALCUTTA,
The 2nd September 1885.

Crop statement for the jurisdiction of A B , patwari of , mouzah , pergunnah , district , in bighas of haths to the luggi, equal of an acre each bigha.

Total area in bighas.	Area ordinarily under dhan.	Under Bhadoi crops alone.				Under Rubbee crops alone.			Double cropped.			Uncultivated and uncultivable.
		Names of principal crops.				Name of principal crops.			Bhadoi.			
		Makai.				Wheat.			Makai and			
									Wheat.			
									Rubbee.*			

H. P.—Reg. No. 237T—1,078—8 7-96.

No. 62-G, dated Bankipore, the 7th December 1885.

From—F. M. HALLIDAY, ESQ., Commissioner of the Patna Division,
To—The Secretary to the Government of Bengal, Revenue Department, Agriculture (through Director of Agricultural Department).

WITH reference to Government, Bengal, memorandum No. 1430-107 Agricultural, dated 25th July last, I have the honour to submit the accompanying copy of a report by Mr. Allen on the subject of the cultivation and trade in wheat in this division. The report is based on information received from District Collectors.

2. I agree in the general conclusion arrived at in the report. As the report received from the Collector of Shahabad is full and interesting, I submit it in original.

Dated Camp Beeheea, the 2nd December 1885.

From—D. B. ALLEN, ESQ., Assistant to the Director of Agricultural Department,
To—The Commissioner of the Patna Division.

IN accordance with the suggestion conveyed in your demi-official of the 23rd ultimo, I have the honour to submit a report on the wheat cultivation of this division. My information is derived from reports submitted by each Collector, and by the Chairmen of Mozufferpore, Gya, Arrah and Durbhunga, and also from independent sources.

Before giving my own views, which, so far as Patna is concerned, are embodied in the report by the Collector of the Patna District, I will here summarize some of the reports to which I have had access.

2. The Collector of Chumparun (Mr. Henry) forwards a resolution passed by the Municipal Commissioners of Motihari, deprecating the construction of a central warehouse for grading wheat, and points out that very little wheat is exported, and that little more than 5 per cent of the cultivated area is grown with wheat.

The Collector of Mozufferpore, Mr. Norman, with whom the Municipal Commissioners agree, thinks that interference on the part of Government with wheat cultivation or trade would be a mistake, and points out that there is little or no export from the district. He also forwards reports from the Sub-divisional Officers and from a Deputy Collector and canoongoe which do not require any special comment.

The Collector of Durbhunga, Mr. Price, as Chairman of the Municipality, is in favour of establishing warehouses near railway stations for storing and cleaning grain, but in another report as Collector, he states that Messrs. Reinhold Brothers' scheme does not commend itself to the trading community at Durbhunga, because it will greatly add to the charges incurred by the native merchants in dealing with European firms, and besides having got their certificate, the storage charges will hurry the market.

The Collector of Sarun, Mr. Forbes, in a report founded apparently solely on personal enquiries, points out there is no export trade, properly so called, in wheat, the only business of the kind being merely a transhipment trade at Revilgunge and Chuprah, where a considerable portion of grain traffic from the North-West Provinces changes hands on its way down the Gogra to Lower Bengal, the remaining portion being retained for consumption in the Sarun district. He disagrees with Mr. MacDonnell's view that there should be an average annual surplus of 20,000 tons of food-grains available for export from this district, holding that the annual supply is not even enough for the local demand. Finally, he is averse to the establishment of central warehouses even at Revilgunge, as there are already private golas there where the merchants clean their own grain as much as they think desirable.

The Collector of Gya, Mr. Norton, and the Chairman of the Gya Municipality are both averse to warehouses, as there has been no export from this district for over two years, and besides, in the Collector's opinion, *kewal* land on which three-fourths bis of the wheat is sown is not suited to growing white wheat.

The Collector of Patna, Mr. Quinn, agrees with me in thinking that central warehouses are a mistake, and though Major Boileau from Dinapore is in their favour as a means for securing a clean sample, he admits that the scheme would cost a great deal of money.

The Collector of Shahabad, Mr. Power, submits a very interesting report embodying lengthy extracts full of valuable information from his Sub-divisional Officers, Messrs Jenkins and Macpherson, and from Mr. Peppe, Sub-Deputy Opium Agent. The Chairman of the Arrah Municipality, the Hon'ble Harbans Sahai, also submits a report in which he agrees with the Collector in thinking central warehouses unnecessary.

3. A consideration of the reports referred to above shows that from the northern half of the division there is practically no export trade in wheat, for the business done at Revilgunge has really nothing to do with the Sarun district. Again, from Gya there is now no export of wheat, and if the Collector's view is correct (of which, however, I am very doubtful), there is no likelihood of good white wheat being ever largely grown in the Gya district. Patna, too, though apparently a large exporter of wheat, really grows little more than is required for its own consumption ; so the main interest of the wheat question centres in Patna City, the great wheat-distributing centre of the division, and the district of Shahabad, where wheat is grown for export, and where much of the soil is so suited for this crop that the best wheat in the Calcutta market, viz., Buxar Club No. 1, is named after a subdivision of this district. Fortunately the reports from Shahabad are full of interest

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and enable one to discuss satisfactorily the various points raised by the Government of Bengal.

4. The first question to which attention is called is the necessity of obtaining clean grain for export. The impure condition of Indian as compared with the wheat of other countries is attributed, as the Director of the Agricultural Department points out, to one or more of the three following causes:—

First.—The mixture of other grains due to the practice of growing two or more crops on the same land at the same time.

Second.—Imperfect arrangements for winnowing the grain and removal of extraneous matter.

Third.—Deliberate adulteration by traders, brokers, or others.

First.—All the reports show the prevalence of the practice of growing other crops along with wheat, and, as I said in my report to the Collector of the Patna District (paragraph 4), the advantage from a cultivator's point of view of sowing wheat alone is not very clear. By sowing a double crop he gets a chance of securing something if the wheat failed. Again when a deep-rooted crop like wheat is grown with a surface feeder like barley, each stalk of wheat has a large area for its roots, and the grains are likely to be fuller and heavier than if only wheat were sown. This is well known to ryots who select their grain seed from fields where wheat has been grown with barley. Then as regards the admixture of white and red wheats, it is extremely probable that soil and climate have the effects of converting white wheat into red. Suppose a ryot pays a high price for securing a clean sample of the best white wheat seed. Unless the soil of his field is suited for the growth of white wheat, the outturn will contain a proportion of red grains, and each successive year, unless fresh seed be obtained, the proportion of red to white will go on increasing. The price of pure white wheat would have to be enhanced before it paid the ryot to separate the red grains from the bulk. But what are the facts? The best wheat exported from Calcutta, viz., Buxar Club No. 1, contains 25 per cent. of red grains. When that is so, why should the cultivator go to the trouble and expense of selling pure white wheat when he gets the best price for white wheat mixed with 25 per cent. of red.

Similar arguments apply to adulteration of mud, &c. These, I believe, the ryot does not add wilfully, because the bepari or petty trader to whom he sells would detect them in his small consignment and pay him an inferior price. On the other hand, the petty trader does not insist on cleaned grain, for he will not himself sell grain containing less than 5 per cent. of impurities, which, if deficient, he will add; for so long as the Calcutta merchants accept 5 per cent as refraction, it would not pay the bepari to sell grain with only one or two per cent. of adulteration. This brings me to the real point of the whole question. It is purely a case of supply and demand. If the Calcutta merchants insisted on cleaned grain they would get it. They do insist on clean samples in the case of linseed, and the result is that linseed is cleaned by the actual cultivators before being sold to the petty dealers. The same result would, I believe, follow in the case of wheat. As matters now stand, wheat in Patna is freely adulterated. Ralli Brothers in Patna city deal only with the petty dealers, and these refuse to give any guarantee with the wheat sold. Each lot has to be tested both for impurities and for the percentage of red grain before the price is fixed. If the samples tested happen to be superior to the bulk, the bepari gains. If they should be inferior, the bepari can refuse to deal, and so he cannot lose either way. The cultivators never get a fair price, for the brokers and the aratdars have each to get their commissions on each transaction between the bepari and Ralli Brothers. In some marts where the grain comes chiefly from the neighbourhood, it might be possible for Ralli Brothers to deal directly with the actual cultivators, but in Patna, where the grain comes largely from Gorakhpore and Fyzabad, this is impossible, and the agent for Ralli Brothers is compelled to deal with the petty dealers, whose interest it is to cheat him if they possible can.

5. Since writing the above, I have had a remarkable confirmation of these views from the manager of the Dumraon Raj, the Hon'ble Jai Prokash Lall. The statements he made were so significant that I took a note of them at the time, and at the same time informed him that I should embody them in this report. The manager said that about two years ago, when the prospects of the wheat trade were apparently good, he seriously thought of cultivating wheat on a large scale. He estimated that on the Raja's estates there were 300,000 acres of land capable of growing wheat, and he proposed commencing operations with a capital of two lakhs His idea was to induce the ryots to grow wheat alone by means of advances in coin and seed, and he intended purchasing machinery such as he had seen at the Calcutta Exhibition for cleaning the grain. All that he now required was a remunerative market. Last year, when in Calcutta on Council business, he called at the office of Ralli Brothers, and after telling them his plans asked what price they would give for clean grain Ralli Brothers informed him that owing to the action of the merchants in England they could not afford to pay more for a clean sample then they now did for grain with five per cent. refraction. Upon hearing this the manager abandoned the idea of growing and cleaning wheat on a large scale It is difficult to overrate the significance of this anecdote, which appears to prove conclusively that so long as merchants will not pay a higher price for clean grain, it is useless for Government to think of inducing cultivators to change their present practice.

6. I then asked the manager about wilful adulteration. He said that he had a gola at Itari, near Buxar, from which he used to sell wheat on rather a large scale to the agent of Ralli Brothers at Buxar. The wheat as he got it did not contain 5 per cent. of foreign matter. Accordingly his servants were directed to mix two maunds of earth with every 100 maunds of grain, so as to bring the adulteration up to the required standard. This earth was treated with water and specially prepared for the purposes of adulteration. The suggestion for adulterating the grain in this way came as the manager says from the employés of Ralli Brothers. This fully bears out what Major Boileau says that grain-dealers in Dinapore wilfully adulterate their grain, adding abount two maunds and 30 seers of dry clay, bhusee, and other grains to every hundred maunds of wheat. Mr. T. Gibbon, C.I.E., the Manager of the Bettia Raj, told me that wilful adulteration was practised by the petty dealers in Chumparun, and Mr. Carnduff, writing from Hajipore, a large grain mart, says: "In the hands of the middlemen when the grain is lodged in their golas, such grain as *akra pipra* are, I understand, intentionally added with a view to adulteration." Mr. Jenkins from Buxar, who has clearly paid a good deal of attention to the subject, is of the same opinion.

7. As regards imperfect arrangements for winnowing, further enquiries have only confirmed the view expressed in paragraph 5 of my report to the Collector, that the present plan is quite good enough under present circumstances. The admixture of dust from the threshing floor even now forms a very small proportion of the adulteration eventually found in the grain, and with greater care it might be reduced still lower.

8. Messrs. Mylne and Thompson have pointed out to me that the adulteration of *gur* is analogous to the adulteration of wheat. When their sugar mills were first introduced, they were valued by the purchasers on account of *their saving labour*, and not because they turned out a *cleaner* article. Even now the Bunniahs in Jagdispore refuse to pay a higher price for *gur* free from adulteration, and though the cultivators *can* produce clean *gur*, and *will* do so if required, it does not pay them to clean the *gur* they sell in open market. There is now, however, a tendency among European firms to pay a higher price for purer *gur*; similarly if the merchants would reduce their standard of refraction, they would get cleaner samples of wheat. This question is treated exhaustively in the report from Shahabad, and it is so difficult to make extracts without omitting something of interest that I venture to suggest that the whole report be sent in original. The possibility of cleaning grain with the ordinary tray-shaped fan (soop) is pointed out by the Collector of Sarun and in the report from the Patna district.

9. I do not refer here to the modes of cultivating wheat, which has frequently been reported, nor have I succeeded in obtaining trustworthy statistics of the areas in each district under cultivation. Figures, which are little better than mere guesses, can be found in annual reports, and the Agricultural Department has not as yet succeeded in obtaining more accurate statistics.

10. The conditions of soil and climate most favourable for the production of the best white wheat cannot be determined off-hand. Mr. Peppe gives valuable information on this point, and the department is now engaged in making experiments at Dumraon, Arrah, Sripur (in Sarun), and in wards' estates in the Patna district, in order to determine what wheat is best suited for these districts, and what is the most economical means of securing the largest outturn; but it must take years before this question is definitely settled. Meanwhile, the best wheat, so far as I know, is grown in a few villages near Buxar, and the method I suggest for improving the cultivation of wheat generally till our experiments are concluded is given in paragraph 7 of my report to the Collector of the Patna district.

The question of improving the quality of wheat is one that is engaging the attention of the Agricultural Department, but it will take years before this question can be properly answered. Meanwhile, the department is carrying out experiments on wards' estate in this district to prove the comparative value of Cawnpore wheat, and the best wheat attainable in this division, viz. that from Buxar. Experiments are also being carried on at Dumraon, Arrah, and in Sarun to determine the best kinds of wheats and the most economical way of getting the largest outturn. Till these experiments are concluded, the quality of wheat might be improved by distributing over the division the best seed now grown in the most favoured localities. The ordinary cultivator is quite incapable of taking a long journey say from Behar to Buxar, in order to procure good seed. All that he can do is to take the best that the local market offers, but it would be possible for the local Agricultural Committees to obtain consignments of good seed. These might be distributed over different markets, and could be sold for a fair price covering the cost of transit either to zemindars or to the actual cultivator. They would be ready enough to buy good grain if it were put in their way, and by this means there would be a constant supply of good selected seed all over the division. So far as I know at present, the best seed comes from a few villages in the Buxar sub-division. If there were a large demand for this seed, it is not too much to expect that wheat in these favoured localities would be grown for seed alone, and it might pay cultivators to try and grow *pedigree* wheat. District shows with prizes given for the best samples of wheat would also help to improve the quality and to disseminate the knowledge of where the best seed can be obtained.

11. One other point that I wish to refer to is the uncertainty of the wheat trade. The exports from Bengal and Behar stations which exceeded 56 lakhs in 1881-82 fell to 26 lakhs in 1882-83, and then rose to 38 lakhs in 1883-84. Since then the trade in wheat has been remarkably dull. The improvement in 1882-83 tempted the manager of Dumraon Raj to consider seriously the advantages of growing wheat on a large scale. In the present state of

the market nothing would induce him to embark on such a speculation, and nowhere in the division is there any landowner who ceases to grow wheat on a large scale.

12. Are we then to resign ourselves to a policy of inaction? I think not. Competent values have proved that Behar can produce wheat that can compete successfully with grain grown in Russia or America. The comparatively low price at which Indian wheat sells is admittedly due to adulteration. We have proved that this adulteration is not due to the negligence or wilfulness of the actual cultivator. It is not inevitable owing to his system of cultivation. It is, I maintain, mainly due to the 5 per cent. standard of refraction. It is no use preaching to the cultivators. They will provide clean grain if the merchants will pay them for it, and there is grain of good quality in the division, whose cultivation can be widely extended, provided the merchants will pay a better price for good quality. As it is, the best price is paid for Buxar Club No 1, which contains 25 per cent. of red grains and 5 per cent. of adulteration, and for part of the year another 1 per cent. is allowed for weevilled grain.

The action of the Calcutta merchants which depends on the English market can only be explained on the theory that they have not realized that adulteration is wilful and not due to the native modes of growing and cleaning grain. If Government can bring this fact home to the merchants in a way that will induce them to lower their standard of refraction, and to insist on a higher percentage of white grain, there is every probability that there will be a revival in the wheat trade. The manager of the Dumraon Raj is not the only man who would gladly grow wheat on a large scale provided he could get a remunerative price, and by diminishing the number of middlemen, the actual cultivator would get a much larger share of the profits. At present the small cultivator is at the mercy of the bepari or petty dealer. He may stand out for a time but when he must have money to pay his rent he is obliged to come to terms with the bepari. Even the bepari does not (at any rate in the Patna City) gain the bulk of the profits, for before he can deal with the agent of Ralli Brothers, commissions must be paid to the brokers and to the aratdars when the grain is stored. Consider too the labour now expended in wilful adulteration, and the freight that is paid for the carriage of dirt. The actual condition of the trade is almost incredible; but the reports that have been received from every district in the division bear out the facts referred to above, and it is noteworthy that those who have given most attention to the subject all agree that it is the merchants—and the merchants alone—who are responsible for this deplorable condition of affairs.

No. 1826G, dated Arrah, the 10th October 1885.

From—A. W. B. Power, Esq., Offg. Collector of Shahabad,
To—The Commissioner of Revenue, Patna Division.

With reference to your No. 310G Circular, dated 10th August last, I have the honour to submit the following report on the cultivation and trade in wheat in this district.

2. What follows is the substance of a note by Mr. T. F. Peppe, of the Opium Department, a gentleman who has made the wheat trade a subject of special enquiry, together with reports from the Sub-divisional Officers of Buxar and Sasseram.

3. Regarding the district in general, Mr. Peppe writes thus:—

"There are two principal tracts in which wheat is largely grown in this district; the first is the alluvion soil called the deara, extending from Buxar to the one and Sreaching a maximum breadth of 10 to 15 miles, with a length of, say, 40 miles, thus including less than 400 square miles. This is the tract in which the beautiful soft white wheat is grown; the land is a rich alluvium annually enriched by the overflow of the Ganges: it is needless to say that no manure is required in this soil for the finest wheats, and that it is in this tract possible to grow as fine wheat as anywhere in India; unfortunately it is in this very tract that the cultivators sow three or four and even more crops in the same field, and this is a fertile source of dirty grain, as when reaped separately they are very often pulled out by the roots not cut, and this carries an unusual amount of dirt with the grain on to the threshing floor, but it can be easily separated if the rayat chooses to take the trouble. From what I can gather, about 40 per cent. of the best wheat comes from this tract. The next in importance is the black clay soil extending from the eastern part of the Sasseram sub-division well into the Bhabooah sub-division, and extending from the Grand Trunk Road on the one side, and on the other to within 15 miles of the Ganges, say, 25 miles by 20 miles = 500 square miles.

"In this tract some of the finest wheat is grown, about 50 per cent. of the whole outturn of the district; the cultivators attempt to keep their seed pure white, but there is a tendency to revert to the red variety: the cultivators tell me that there is no market for red wheat, and that they endeavour to produce a pure white soft wheat without admixture of any kind, and sow it entirely by itself, only a little linseed is sown round the margin of the field, and the whole *rubbee* cultivation in some villages in this tract is confined to wheat and linseed, with small patches of barley and other crops for home consumption. The wheat from this tract, although very good, is not equal to the wheat grown on the alluvium lands, and sells for one to two seers less in the rupee. The third principal cultivation of wheat is the koeries and others, amounting to about 5 per cent., who sow on dih* lands all over the district, one bigha or so at a time on rich dih land well manured and irrigated. This is probably as fine grain as could be produced in this district,

* Lands adjoining the village site.

and the only improvement that could be effected would be by sowing a better class of seed, which the koeries and others would be very glad to do; as it is they carefully select their seed and endeavour to get rid of all bad grains before sowing. There is a fourth source of wheat, viz., the small patches of wheat sown in good soil at the foot of the hills or in the valleys or local alluvium along the banks of the smaller streams; this does not amount to more than 5 per cent. of the wheat grown in the district, and is very variable in quality, a large proportion being red wheat in the south of the district. With regard to the question of increasing the cultivation, the whole of the deara lands could be sown year after year with wheat without any loss in quality, for the land is annually renewed by a rich deposit, and therefore the produce of this tract could be enormously increased, and no doubt the time will come when the value of a well-bred wheat crop free from earthly particles or any other kind of grain will be as well known to the wealthy cultivator of the deara as to the British farmer. At the present time a ryot who holds 100 bighas sows 20 in peas, 10 in barley, and the rest 70 bighas in grain* and wheat mixed. Their argument is this: suppose that 10 bighas wheat and 10 bighas grain were sown separately, if either the grain or wheat failed, there would only be 10 bighas full and 10 empty; whereas in the other case the whole 20 bighas would be under a crop, and although thinly sown it would spread and fill the whole field, and give a much better crop than a thickly sown one of 10 bighas; they have no crop that could be sown on the empty field, so that there is no probability whatever that this practice will be abandoned; at present 6 punchseeries of wheat to 3 of grain is sown, and the produce is in a favourable season 18 maunds wheat 5 maunds grain.† At the time of selling grain to the mahajun or travelling bepari the custom is to clean a measure of wheat to take the dust and earth out of this quantity and add it to the weight they are weighing with usually a punchseeri. and in this way the bepari buys the clean grain only. If the bepari had instructions from his mahajun to buy clean grain only, then the whole would be cleaned, and there would be very little mud or dirt left in it. All that is required to secure clean wheat is therefore a combination among the exporting firms in Calcutta not to purchase wheat unless it is clean, say, 1 per cent. refraction, or whatever is found a practicable percentage. The cultivators will then supply clean wheat: no machinery is required by them; they will clean it by a sieve and by soop,‡ and the mahajun will at the same time clean his wheat before despatching it by rail: many of them do so now, and if the exporting firms in Calcutta would only insist on clean wheat, clean wheat would be the rule. Ordinary wheat brought as it comes from the district contains 6 per cent. on an average of impurities, 3 per cent. being grains and seeds of kinds, and 3 per cent. earthy particles: the whole of this can be taken out of it at a cost of 6 pie per maund, and there will be a gain of 3 seers of grain and seeds which will bring 3 pie, so that the actual cost is not more than 3 pie per maund for labour and the cost of 3 seers less grain, which at 18 seers for the rupee would cost 2 annas 8 pie per maund, making the total cost 2 annas 11 pie per maund, or in round figures 3 annas per maund. The grain-dealers in Arrah say that it is already the custom to clean the wheat before despatch to Calcutta, and in the case of linseed, the custom is universal, and no uncleaned linseed is despatched; there are two large godowns in Arrah where the linseed is cleaned by European appliances imported at considerable cost in order to get it thoroughly cleaned, and if this has been done for linseed, it follows that the same could be done for wheat. Even the travelling *bepari* who buys the linseed from the cultivators has it cleaned before buying it, not as in the case of wheat taking an allowance for the dirt. The grain-dealers in Arrah and the cultivators declare that there is no difficulty whatever in cleaning wheat, and that if clean wheat was purchased and no other, the whole would be cleaned. One advantage in despatching clean wheat is the percentage given by the Railway for wheat put up in double bags ready for export. Nothing will be done unless the merchants themselves supply the motive power by refusing to purchase anything but clean wheat; this done, all the rest will follow. I do not think the export of wheat or any other grain could be facilitated by any measures that Government could undertake: the custom is for the *bepari* to go round the villages and collect the wheat from the cultivators and carry it off on pack-bullocks, and he has therefore to leave the roads entirely and carry it across country to the railway, and roads of any kind cannot affect the trade to any great extent. At the present there is no good metalled road leading to the black clay soils which I have described above as being the largest wheat-producing tract in this district; and if the present road leading from Chowsa to Jehanabad on the Grand Trunk Road was metalled, it might do good. The traffic at present is entirely by pack-bullocks. The scheme proposed by Reinhold Brothers is more applicable to large stations than to the small stations in this district; but of late years the natives are building golas near all the railway stations, and if land was made available on easy terms, they would be still more largely used, and at these golas the cleaning and packing would be carried on as at present preparatory to despatch by rail. Government might through the officers give facilities for taking up lands in the vicinity of stations on the line of railway for the purpose Beyond this, I do not know of anything that could be done. I had an opportunity while at Doomaron Exhibition last cold weather of going over the exhibits of wheat at the show, and was very pleased to see that some of the samples of wheat were of a very high quality, and compared favourably with the wheat from other districts, and I feel sure that if good wheat for said purposes could be made easily available, say at sub-divisional head-quarters, some good might be effected. The eagerness

* Chick pea.

† Per local bigha=⅘ of an acre.

‡ Winnowing fan of bamboo, tray-shaped usually.

with which the ryots present at Doomraon asked for small samples of improved varieties of seed was very marked, and I find the Koeries in this district very much alive to the advantag s of good seed."

4. The best wheat in India takes its name from Buxar (Buxar Club No. 1). Mr. Jenkins reports as follows :—

"Attention is drawn first of all to the necessity of obtaining a clean wheat for export. The principal causes of impurity are stated to be—

(*a*) The practice of growing two or more crops on the same lands.

(*b*) Imperfect methods of winnowing grain.

(*c*) Adulteration by traders.

* Mustard.
† Safflower.

As regards the first point, it is the practice here to sow *sarso*,* *kasum*,† linseed and grain with white wheat, but at the same time in villages where the latter kind is specially grown, it is also sown as a single crop by big cultivators. Detailed statistics could be procured near *rabbi* season as to the area under wheat only. The cultivators are alive to the advantage of growing it singly, but from fear of drought or blight they are afraid to trust to one crop only. Again as long as the standard of refraction in Calcutta is 5 per cent., the cultivators would not gain by sending cleaner grain because the traders would at once adulterate it up to the authorized standard. The admixture of *kankar* is especially objected to, because it damages the mills in England. Linseed is objected to in a lesser degree, while other grains, like gram and barley, are hardly objected to at all, because they can be absorbed in bread-making. To avoid the admixture of *kankar*, Messrs. Ralli Brothers (who buy wheat as far as Moghul Sarai) insist on absolutely clean parcels—a condition which forces beparis and cultivators to take more pains in cleaning their grain. As regards the second cause of impurity, as long as the present method of winnowing by a soop, *i. e.*, basket, exposed to the wind is the cheapest, it is out of the question to try and induce the cultivators to adopt any other method. It is for the trade to introduce winnowing machines.

Thirdly, as regards adulterations, beparis and traders deliberately practice this. If a bepari or trader buys from cultivators wheat with only 3 per cent. of admixture of extraneous matter, he would lose 2 per cent. in exporting to Calcutta, unless he added more dirt to meet the 5 per cent. allowance. Again as the grain must necessarily be often imperfectly tested in Calcutta, traders add dirt which will be equivalent to 7 or 8 per cent. on the chance of not being found out. It is at present the interest of most traders not to export clean grain, and consequently they are not in favour of cleaning godowns at stations. The only remedy is to lower the standard of refraction or for the merchants in London to buy only clean grain. I believe that it is the policy of Messrs. Ralli Brothers only to export clean parcels.

Qualities of wheat grown.

The following kinds are exported from Calcutta :—

No. 1 Club containing about 75 per cent. of white and 25 of red wheat and exported from Buxar, Delhi, Meerut, and Alighur. In some villages south of Buxar the percentage of white wheat is as high as 85, while the general average in the sub-division is 80 per cent.

No. 2 Club is also a white wheat, but I am informed that no distinction of percentage is observed in the trade. As regards places of export, it is sub-divided into (*a*) Kanhpore and Lucknow as far as Fyzabad; (*b*) Fyzabad to Lucknow, an inferior quality known under the name of Nawabgunge wheat.

No. 3 Club, *ganga jali*, hard red.

No. 4 Club, *ganga jali*, soft.

Neither of these kinds are much wanted for purposes of export. Buxar soft white wheat is largely grown in the southern portion of the sub-division in the following villages :—

(1) Mathela, (2) Alam, (3) Kesulle, (4) Karsand, (5) Kalikuar, (6) Bhalowli, (7) Rupsagar, (8) Talpe, (9) Atter, (10) Bhadar, (11) Nawa Naggur, (12) Buxar, (13) Mahada in Bhojhur, (14) Bijhowra, (15) Kukurha, (16) Jameoaon, (17) Jamouli, (18) Kallyanpore, (19) Lohandi, (20) Nuwas, (21) Dhansai, (22) Sesaundha, (23) Somontha, (24) Gogahi, (25) Chelhar in Chaussi pergunnah.

The soil most suitable for it is soft Karail. In Bijhowra village, where the best white wheat is grown, the soil is a mixture of Karail and Banger in the proportion of ¾ths to ¼th.

The method of cultivation is as follows :—The land is first ploughed in Asâr, and then is re-ploughed eight times before Asin, when it is harrowed, and the seed then sown. In fields where two or more different kinds of seeds are to be sown, all the seeds are mixed and sown at the same time. The fields are irrigated twice, viz., once in Pous and again in Magh. No weeding is necessary on pure wheat fields. In Cheyt the crop is cut and taken to the Khalitran.

The cost of cultivation may be roughly estimated as follows :—

	Rs.	A.	P.
‡ Rent per bigha	8	0	0
Cesses	0	4	0
Cost of ploughing eight times, at four annas each ...	2	0	0
Value of 30 seers of seed	1	8	0
Cost of cutting crop, &c.	1	8	0
Canal rate	1	4	0
Total ...	14	8	0

‡ In Guzashta lands rent varies from Rs. 3 to Rs. 5.

Average outturn per bigha 10 maunds, the value of which is Rs. 20. Net profit Rs. 5-8.

The time has been too short to get statistics of area from patwaris. Speaking roughly, after making local enquiries I estimate the area under white wheat cultivation between 30 and 40,000 bighas. An approximate idea of the extent of the trade can be formed from the following export figures :—

1882-83.	Mds.
Raghunathpore	83,000
Doomraon	30,000
Buxar	30,000
Chowsa	2,26,500
Total ...	6,39,500

1884-85.	Mds.
Raghunathpore	50,060
Doomraon	25,522
Buxar	66,252
Chowsa	1,83,184
Total ...	3,25,018

The figures for 1885-86 are of course not complete; 1882-83 was a year of good prices and good harvest; since then prices have been getting worse and the harvest the same. The season of 1885 was worse than that of 1884.

The above figures are almost entirely for white wheat; very little red wheat is exported as it is chiefly used for local consumption. It should also be remembered that these figures include a good deal of white wheat grown in the Sasseram sub-division.

Lastly, as to the question of establishing warehouses at stations.

It has already been pointed out that as long as the standard of refraction is 5 per cent. in Calcutta, it is not to the interest of the petty trade to send clean grain at a lower rate of refraction; consequently petty traders, besides objecting to pay any charges, would prefer not to clean the grain that they export. Again, large firms like Messrs. Ralli Brothers, who do export cleaner grain, prefer to make their own arrangements. The matter is really in the hands of the trade, to whom it should be left."

5. Sasseram sub-division has been noticed in the general remarks on the district. Mr. Macpherson gives the following detailed facts :—

"The extension of canal irrigation in this district has led to the growth of winter rice at the expense of wheat, especially where the soil is of a light loam or sandy. The western half of the Sasseram sub-division consists, however, of a black heavy loam or clayey soil known as karail, which, when wet, is difficult to work for paddy cultivation; but its retentiveness of moisture renders it admirably adapted for the growth of wheat, which accordingly forms the staple crop of that part of the country. The land intended for wheat is for the most part ploughed up about the beginning of the rains and allowed to be in open fallow until they cease, several additional ploughings being given in the interval. It is, however, sometimes grown after a crop of early rice, or, where the soil is light, as in the north of the district, after maize; but in such cases it naturally does not succeed so well. Manure is not used, except sometimes by koeries, who apply old cowdung about the beginning of the rains. The seed is sown by drill about 1¼ pucca maund to the acre. There are two varieties of seed sown, the white (*dundia*) and red (*lallka*). They are generally grown mixed together. The white seed owing to the character of the soil in Sasseram sub-division is apt to turn red in time, and has to be replaced by fresh white seed every few years. On the heavy *karail* lands, the seed is not often mixed with that of other crops, but linseed is often grown round the borders of the fields, and in strips here and there through them. Barley and wheat are often grown together as a mixed crop on the lighter soils, and sometimes grain and peas are also sown with the wheat. The crop hardly requires any irrigation at all on the heavy soil characteristic of the west of the sub-division, as the soil itself is so retentive of moisture. The crop is benefited, however, by showers just before it comes into flower. Thereafter the west winds of March are very beneficial to it. Reaping is done by the sickle, and the sheaves carried to the threshing floor when they have thoroughly dried; the grain is trodden out by bullocks, and afterwards winnowed by being shaken in a basket (soop), of the shape of a household dust shovel, exposed to the high west wind which usually prevails at that season. From the above description, it will be observed that there is every chance of the grain, when it comes from the threshing-floor, being found to be a mixture of white and red wheat, and also to have a large admixture of the dust of the threshing floor. Both form serious defects in grain intended for the European market. The winnowing basket, however, removes a very large portion of the dust of the threshing floor, and it is almost hopeless to expect that it will ever be replaced in the hands of the cultivator by any of the winnowing machines now available. The cheapest and best of these—the Cawnpore Farm combined winnower and grain separator—is too dear; the additional price obtained for clean grain from this district would not recoup its cost. As for the mingling together of different varieties of

wheat, even the grain-dealers here would not buy the red wheat by itself. They say that they could get no sale for it in the Calcutta market. It is true that the red variety is more prized for local consumption, being considered more palatable, but in view of the unsuitability of the soil to white wheat, it would be impossible for the cultivator to dispose of all his red wheat so long as it does not command a remunerative piece by itself in the Calcutta market. The higher value of white wheat for export 2 annas a maund more than for red—is well enough known; but considering the competition of the white wheat sent from up-country, where the soil is better adapted for its growth, the cultivator would not secure a price for his white wheat if grown by itself that would compensate him for the loss he would incur in disposing of the red The best quotation for wheat in this locality is for a mixture of 25 per cent red, and 75 per cent. white: no doubt a smaller percentage of red would command a higher price, but, as already observed, it is not practicable for the cultivator to send less to the market, so long as there is no demand for it on the part of the local agents of the Calcutta merchant. The grain exported from this sub-division is all sent to Calcutta, and chiefly to Messrs. Ralli Brothers. There is little admixture of grain of other cereals with wheat exported from this sub-division. On the heavy soils, it is generally grown by itself except for some strips of linseed, which are separately gathered without difficulty. From what has been said, it may be gathered that any measures taken to secure a purer grain must receive their initiative from the Calcutta export merchants. Until they offer a remunerative price for red grain from this district, it is hopeless to expect the cultivator to grow red and white grain separately from one another, or to take any trouble to separate them after threshing. If these merchants think that they themselves would secure a price for each class of wheat separately which would cover the cost of having them separated from one another by their own agents or employers, there is no reason why they should not have the process carried out either in Calcutta or at warehouses established at the principal railway stations to which the wheat is brought. They would probably find it cheaper to have the process carried out at the railway stations, as with it could be combined the cleaning of the grain from all admixture of durt, which would lower the cost of transport to Calcutta, and labour and warehouse-room could be obtained cheaper than at Howrah. But so long as they themselves do not see their way to doing this remuneratively, it is, I think, hopeless to expect that the cultivators themselves will. There is no need to take account of the intermediaries through whose hands the grain passes If the different varieties of wheat are not grown separately by the ryots themselves, and separated by them from all admixture of dirt and other impurities, the separating and cleaning process can best be carried out at the railway warehouses either up-country or in Calcutta. In this matter, I think Government officers can do nothing to improve the quality of Indian wheat exported to European markets. In the matter of communications also Government can do little that is feasible to assist the export of wheat from this sub-division. The whole of the wheat sent from this is exported on cargo boats by canal to Arrah. The merchants say none of it goes by road. There is a metalled road all the way to Doomraon, the nearest railway station to this, but none is sent there. They do not even send the wheat to Buxar, although they can do so by steamer or cargo boat direct. They find that the saving in railway freight makes it most profitable to send all the grain to Arrah. What they are extremely anxious to get is direct steamer communication between Bedadih beside Sasseram and Arrah. They say this would greatly facilitate their trade. The canal steamers have now been given in contract to a private individual, and no doubt if he considers that it would pay him to run a steamer direct between Bedadih and Arrah during the grain export season, the thing will be done There would probably, however, be little freight for the return journeys to Bedadih What the total export is at present I cannot say. The statistics can, I presume, be easily got from the canal and railway authorities. I do not think that much can be done to facilitate the wheat trade by opening out local communications. The grain is all taken from the villages by "beparis" on pack-bullocks, and I have found little desire among the villagers to have roads opened out which would enable them to send their grain to the local marts by carts; still as the communications of the district gradually improve and extend, there can be no doubt that cart traffic with villages will increase, as it is cheaper than using pack bullocks, but no special measures need be taken beyond the improvements that are being gradually effected by the Road Cess Committee in the ordinary course of its operations. With regard to the dissemination through the aid of Government of information regarding prices of grain, the prospects and results of the wheat harvest, and other matters of interest to those engaged in the cultivation of, and trade in, wheat, I must express my opinion that much cannot be done in this way in this sub-division. I have already stated that there are good reasons why the cultivator should grow his red and white wheat together. I do not think much good to the wheat trade would result from sending out broad sheets in this part of the district to him. There is no harm in circulating a broad sheet on the cultivation of wheat as is proposed to be done in the Punjab, but great care would have to be taken that the suggestions for improvements contained in it were thoroughly adapted to the circumstances of each locality. The circumstances of Buxar and Arrah sub-divisions, for instance, differ considerably from those of Sasseram in this matter of wheat cultivation. As for the grain merchants here, they speak as if they would be anything but thankful for additional information spread broadcast regarding the condition and prospects of the wheat harvests and markets elsewhere. They get all the information they require by telegraphic and written advices from Calcutta, and they say that the only effect of publishing such information would be to increase competition

and reduce their own profit. From this it would seem that, although action in this direction might affect their profits. it would, on the whole, do good to the trade in wheat. On the whole, I am of opinion that, so far as this part of the district is concerned, Government can do little to facilitate the foreign trade in wheat, and that before it can be expected to interfere to any extent, it should be shown that the wheat merchants of Calcutta and the railway company have done all that lies in their power to increase the facilities for the trade. I think the merchants might do something towards cleaning and separating the grain in some such way as has been suggested by Messrs. Reinhold and Brothers. With regard to the railway arrangements, those who export wheat from this have no complaint to make."

6. Not having been in the district during a cold season yet, I do not feel called on to add any remarks of my own to the information supplied by the officers beforementioned beyond expressing an opinion in concurrence with theirs, viz, that if the merchants want clean wheat, they must lower the standard of refraction.

No. 1047Ct., dated Camp Khagareah, the 31st January 1886.

From—H. F. J. Kean, Esq., Offg. Commissioner of the Bhagulpore Division and Sonthal Pergunnahs,

To—The Director of the Agricultural Department, Bengal.

With reference to Government of Bengal's circular No. 1431—108Agri., dated the 25th July last, on the subject of the cultivation of wheat and the wheat trade, I have the honour to submit the following report, after taking the opinion of the district officers of this division, who in their turn report that they have consulted the Municipal Committees in their respective districts.

2. *Wheat-producing areas.*—Wheat is produced in all the districts of this division Generally speaking, the valley of the Ganges is best suited to its cultivation. It is grown in abundance in the Sudder and Beguserai sub-divisions of the district of Monghyr; on the banks of the rivers Ganges and Kusi in the district of Bhagulpore; in the lands lying to the east and west of "Ganges and Darjeeling Road;" in the districts of Purneah that are subject to inundation from the overflow of the Gánges and the Kusi rivers; in that half of the district of Maldah which lies to the west of the river Mohanunda and consists mostly of low alluvial land; and on the alluvial deposits of the Ganges and lands close to that river, but not inundated in the district of the Sonthal Pergunnahs.

3. *Different kinds of wheat grown*—The following three sorts of wheat are generally grown in the districts of this division, namely, dudhea, jamali, bargowan.

4. *Dudhea*—The dudhea is the best sort of soft white wheat, but its cultivation requires a very considerable amount of labour as well as care. In the district of Monghyr this wheat is cultivated to a very considerable extent, but only to a limited extent in the other districts. The Collector of Bhagulpore reports that the reason why the ryots hesitate to grow dudhea wheat in preference to the red wheat is because the cultivation of the former is not only attended with various difficulties, but also because there is always uncertainty and danger as to the result. In the first place the dudhea wheat can be grown only in kewal lands, either Telia or Bhora. The Telia kewal land is the black greasy soil, such as may be found in the chowar or low lands. It is hard and difficult to be ploughed, and unless well broken up by repeated ploughing, the produce of dudhea wheat will be inferior, both as regards quality and quantity. The Bhora kewal land is a greasy soil of brownish colour. It is also called jhagir land. It is not so hard as the Telia kewal land, but requires a greater quantity of manuring than the latter. The seeds grown in Bhora kewal land are again supposed to be harder, and therefore of inferior quality to those grown in the Telia kewal. The quantity of manure required for the cultivation of dudhea wheat is greater than for the ordinary wheat, and the ryots sometimes find it beyond their means to procure a sufficient quantity.

5. *Jamali.*—The jamali or the red wheat is grown in all the districts of this division. The soils best adapted to its growth—Telia kewal, Bhora kewal, Tekul kewal (high lands with kewal properties) and Doras or mixture of red and kewal land. The cultivation of jamali wheat is simple and less costly than that of dudhea wheat. It does not require so much care and labour in ploughing and manuring.

6. *Bargowan.*—The bargowan or hard red wheat grows only in the Singhea kewal lands or soft stratified soil. It is grown in abundance in the deara lands, and is therefore called gungajali in some districts. The cultivation of bargowan or hard red wheat requires no manuring, the deposits of the Ganges serving the purpose.

7. *Impure condition of the Indian wheat.*—From the reports received from the district officers, it appears that the mixture of wheat with dirt and other inferior grains is caused by the crude method of cultivation followed by the agriculturists. They are too poor to afford expensive improvements, as well as conservatives in their principles. But there is no reason to suppose that they would fail to grasp the advantage to be obtained by an improved selection of seed and an improved system of winnowing, provided such improvements were demonstrated to be beneficial, and the cost were not beyond their means. The Collector of Monghyr reports that wheat is sown in his district with other crops, such as gram, oilseed, &c, in the same field, but the mixed varieties of wheat are not sown. The cultivators are not careless as to the selection of seeds, but they prefer to grow mixed crops with a view to secure a better outturn, and at the same time to guard against the risk of failure, to which

they would be liable by growing an unmixed crop. In some localities the cultivators do not grow mixed crops. The Collector of Bhagulpore gives the following reasons for the mixed varieties of wheat grown in his district:—

(1) That the cultivators, with all their experience, find it difficult to decide whether certain land would yield a good outturn of pure white wheat. In such cases they sow jamali or soft red wheat and dudhea or soft white wheat together.

(2) That when the ryots fall short of their stock of seeds, they do not hesitate to mix red with white to the extent of the shortcoming, and when the proportion of the admixture is not great, they generally entertain a hope of passing the whole produce as white wheat.

The Collector reports that instances have been brought to light in which the middle dealers in grains mix 5 per cent. of red wheat dirt, &c, with the white wheat without any fear of being detected. Efforts are, however, being made in this district by explaining to the ryots the necessity of taking more care for the production and storage of pure and clean grain for export. The fact that the club or soft wheat commands a higher price in the market is particularly explained.

8 *Establishment of warehouses near Railway stations or other central depôts* —Almost all the district officers are of opinion that the provision of warehouses near railway stations or their central depôts for cleaning of grain impurities will not produce any beneficial results. In the districts of Monghyr the wheat trade is chiefly in the hands of the Bengali mahajans and Marwaries. They have their principal places of business and golas or store-houses in towns, and several places in the interior of the district, where the produce is stored after being cleaned and weighed until sent off by boat or rail in bags The Bengali mahajans generally transport their goods by country boats, which take about 14 or 16 days on the voyage down to Calcutta. This is a cheaper means of transport than the railway. The Marwaries, on the other hand, generally despatch their merchandise by railway. Their business is, however, not so extensive as that of the other traders. The Collector reports that, as far as the wheat and grain trade of his district is concerned, the introduction of the scheme of warehouses near railway stations, for the purpose of cleaning and classifying the wheat, would not be likely to succeed, as so much of the wheat transport is by river route. In the district of Maldah, at the beginning of the harvest, the mahajans themselves go to the interior, collect the wheat and store it in convenient places till they load their boats for export, which then go direct to their destinations from those places. The wheat before being exported to other districts is not brought to the Sudder station or to any other mart, and the establishment of warehouses in this district will therefore be of little or no advantage. The Collector of Purneah reports—"I do not think the plan suggested of making provision of warehouses near railway station or other central depôts for cleaning wheat from impurities would do near here, as it would be expensive and throw too much responsibilities on the railway, besides interfering too much with traders" The wheat export in the district of the Sonthal Pergunnahs is too small to require warehouses. The only district officer who is in favour of the establishment of warehouses near railway stations is the Collector of Bhagulpore, who says that such a measure will produce good results; but I do not think that the scheme will be successful in his district, as much of the wheat is sent by river route, like in the district of Monghyr.

9 *Cultivation of wheat in the district of Maldah.*—I beg to enclose herewith a note prepared by Mr Reily, Manager of the Chanchal Estate, on the cultivation of wheat in the district of Maldah. It will be seen that the ryots of this district have but lately taken to wheat cultivation, and do not understand it properly. I would draw special attention to the concluding portion of Mr. Reily's note, and would be glad if anything could be done towards helping the ryots with advise.

READ—

Punjab Government letter No 95, dated 19th March 1885.

Paragraph 1 of Punjab Government letter.—The area under wheat in this district is more than twice the area sown in 14 years ago. Speaking of the portion of the district with which I am more familiar, viz. the north-western portion, 14 years ago not a wheat field was to be seen; now, however, a very large area is sown each year, and the area is steadily increasing. The ryot finds a ready sale for the crop, and though the wheat, I am told, is far interior to that raised in the Punjab, it yet finds a ready market in Calcutta.

2. In 1879-80 over 50,000 maunds were purchased by one Calcutta firm in this district alone.

3. *Paragraph 2 of Punjab Government letter.*—I believe a good deal could be done to improve the variety of wheat sown in this district, if the ryots were supplied with good seed grain The cultivators of this part of the country have only begun to cultivate this crop of late years, and are extremely ignorant as to the soil best suited for the crop In many instances the seed is sown too early, before the temperature is low enough to allow it to germinate freely. I have more than once had it brought to my notice that the wheat wont germinate, though the seed has been over 10 days in the ground The seed of nearly all the crops with which the ryot is familiar germinate in three or four days,

and he does not understand why it is the wheat does not germinate in the same time. In 1881-82 the seed took over 12 and in some cases 15 days to germinate. In many instances the ryots ploughed up the lands and put them down in old seeds, thinking the seed was bad, but in those cases, when the field was left undisturbed, the crop continually turned out a full one.

4 In India. at any rate in this district, no attempt is made to pick the best years for seed grain. A portion of the entire yield of the field is put way for the seed grain of the following year, with the inevitable result that in course of time the crop must deteriorate. The ryot would gladly avail himself of good picked seed if it were procurable at a cheap rate ; and the Agricultural Department might well undertake to supply this want.

5 In this district wheat is seldom sown with any other crop, and thus does not get mixed with other grain, as appears to be the case in the Punjab. I have not found that it is adulterated in any way, except that a large quantity of earth, &c., finds its way along with the wheat But this is due to very primitive mode of winnowing the grain, and not any intention to defraud.

6. *Paragraph 4 of Punjab Government letter*—The East Indian Railway gives the trader an easy means of tranport for all wheat he may wish to export from this district. But it is a significant fact that only a small portion of the wheat sown in this district finds its way out of the district by rail, except in years of extraordinary high prices. By far the largest portion is exported by boats when the floods are out, and boats can find their way to each village along the smaller water-courses and inundated lands.

7. Why the rail is not used is. in my opinion, due not so much to the high rates of freights, as to the difficulties and expenses thrown on the producer or small trader before the produce can find its way to the rail. This district is peculiarly situated, inasmuch as it has the Ganges—a wide and difficult river—between it and the line of rail ; and, however incredible it may appear, it is nevertheless a fact that the entire length of river from Sahebgunge station in the north, to Bhagwangolah Ghât in the district of Moorshedabad in the south, a length of over 120 miles, there is only one Government ferry, and where the rates for crossing are fixed And even here the ferry yields a large profit to Government. A great deal has been done of late years to improve and increase the means of communication ; but the matter of ferries has been, I fear, overlooked, and is a matter that will force itself into notice before long, and will have to be taken up. The producer pays a road cess, and out of this money the roads are made ; but unless the ferries are brought under control, the tax-payer is robbed of the full benefit of the roads made out of the taxes paid by him. I cannot see why ferries should not be thrown open to free competition. A license should, however, be demanded as a means of registration. At present every zemindar makes it a means of profit to the detriment of the trade of the country.

8. *Paragraph 13 of Punjab Government letter.*—I have already expressed an opinion that it would be a great boon to the cultivater if really good picked seed were made available to him as seed-grain. I am also of the opinion that a paper on the cultivation, harvesting, and winnowing of wheat would be of great benefit to the ryots of the district. The crop is a new one, and the ryot really knows very little about it, and would be glad to avail himself of any information the Agricultural Department is in a position to offer,

H. R. Reily,

Manager, Chanchal Estates.

No. 255, dated Bhagulpore, the 30th November 1885.

From—S. Sakhawat Hossein, Esq., Assistant to the Director of the Agrl. Dept.,
To—The Director of the Agricultural Department, Bengal.

I have the honour to submit a report called for in your letter No. 416, dated Calcutta, the 2nd September 1885.

2. Of the three causes to which the impurity of Indian wheat is generally attributed, the first one, viz. the mixture of other grains, due to the practice of growing two or more crops on the same land, and at the same time, does not appear to be very serious. This practice is not very common. Oilseeds and gram are sown with wheat, but not very largely ; and I agree with you in thinking that the advantage likely to be gained by cultivator by the production of pure grain will not compensate him for the risk he would incur in trusting to his wheat crop alone. In *dearahs* chiefly this practice is to some extent followed ; and as *dearah* wheat is of inferior quality, being *jamaee* and *burgohma*, and should therefore be used for home consumption, this practice ought not to have any influence on its export trade.

With the rise in the trade of wheat, it is hoped grain of the fine, soft variety alone will be exported, and with this quality of wheat foreign grains are not often grown In *bhita* (high land) and *chour* lands, where best *doodhi* is grown, the practice of growing mixed grains is seldom resorted to.

3. The second cause alleged for the impure condition of Indian wheat is the imperfect arrangements for winnowing the grain. The present class of cultivators or ryots are unable to introduce a more expensive method of winnowing grain than is in vogue at present. Possessing small holdings, they are hardly in a position to improve the existing mode, unless some cheap winnower is invented, which has not yet been done. The Cawnpore

winnower, not much within the means of average ryots, has withal been pronounced a failure I am afraid a cheap, and at the same time an efficient, winnower cannot be obtained, and expensive winnowers are beyond the means of individual cultivators. Spirit of combination is not much known out here. Grain-dealers or exporters of grain are the only persons on whom, in the present state of affairs, the work of cleaning and winnowing grain naturally devolves. Then the question is whether this work should be done in capital towns or in the mofussil from where the grain is originally sent. The railway freight on goods sent by rail is not inconsiderable, and therefore it would be of much importance if the winnowing be done in the mofussil, perhaps at principal *golas* at sudder stations. The saving in railway freight to be effected by removing dirt and foreign grain before the goods are sent by rail will reduce the incidental expenses of taking the grain to the English market, and thereby increase the export trade. This work can best be done by the *goladars* and mofussil *mahajans*, or by a special firm, and I have no doubt the Agricultural Department can do much in inducing them to undertake the work. Another plan would be to have a thrashing machine sent out from England, and on hire system the crop may be thrashed. The cost of thrashing by machine will not be much more than under the native treading system. In England the cost of thrashing wheat comes to about 2*s* a quarter, and in India it would be as much.* If coal is dearer, labour is cheaper. Then the same operation will thrash corn and winnow it. Under the native system the exact cost of thrashing and cleaning can, with difficulty, be obtained. From the "Field and garden crop of the North-Western Provinces," issued by the Department of Agriculture and Commerce, I find the cost of thrashing and cleaning wheat for 20 maunds is put down at Rs. 3 6. A quarter is equal to six maunds, and therefore the cost of thrashing under the native system is about Re. 1 per quarter, or 2*s*. per quarter.

4. Dealing with the third alleged cause of the impurity of the Indian wheat, I have the honour to remark that with better knowledge it is hoped this cause will cease to exist of itself. From enquiries made by me, I cannot say that any systematic adulteration is attempted by traders.

5. From your paragraph 10 of the letter under reply, it appears that since 1880-81 there is a positive decline in the export trade of wheat from the Lower Provinces. So far as Bhagulpore and Monghyr are concerned, this decline has been, to a large extent, due to bad years. here has been more or less drought felt since some years past, and this drought affected the produce sensibly. In the North-Western Provinces and elsewhere, where irrigation canals have been constructed, or where other means of artificial irrigation exist, drought affected it only in a small degree. In Bhagulpore and Monghyr districts wheat is grown in three localities—

(1)—On *bhita* or high lands;
(2)—*Chour* or open spaces subject to annual floods; and
(3)—*Dearahs*.

Bhita land, being entirely dependent on rainfall, suffered much from drought. *Chour* land did also the same Only *dearahs* had not much complaint of want of water, but there good wheat for export is not produced. In dry years *boout* and *oilseeds* are grown more than wheat.

6. Coming now to the question of the area under wheat, I have the honour to observe that, without the help of village agencies, on whom sufficient reliance can be placed, the task of collecting statistics of this nature is hopeless. In future years, when the Putwari Bill is passed into law, and is in full force, it will be time to set about this work with some hope of getting statistics on which the public may be invited to place some confidence. I left this work therefore undone.

From rough enquiries, it appears that in Bhagulpore wheat covers about 50 to 75 per cent of the area under *rubbee* crops, which again occupy nearly half of the cultivated area of the district. Thus the area under wheat comes to ¼th to ⅜ths of the area under cultivation. The area under wheat is, however, never fixed. What I have stated above refers to normal years. In years of unfavourable season, grain, oilseeds, or other crop take the place of wheat.

7. Some of the practical steps which I have taken to advance this export trade of wheat are—

First, the introduction of Buxar and Cawnpore wheat in some selected places in Bhagulpore and Monghyr;
Second, the trial of some manures on wheat crop; and
Third, the distribution of the translation in vernacular of the market prices supplied by the Chamber of Commerce.

8. In conclusion, I have the honour to remark that I am still making enquiries into the subject of wheat, and I hope to give more information later on.

No. 322, dated Bhagulpore, the 15th December 1885.

From—S. Sakhawat Hossein, Esq., Asst. to Director of the Agricultual Dept.,
To—The Director of the Agricultural Department, Bengal.

In continuation of my letter No. 255, dated 30th November 1885, submitting a report called for in your letter No. 416, dated 2nd September 1885, I have further the honour of stating as follows.

2. The enquiries referred to in the last paragraph of my first letter on the subject had reference principally to the collection of information on the subject of total quantities of wheat produced in the districts of Monghyr and Bhagulpore. I have no hesitation in saying that I have completely failed in the undertaking. The returns sent in by the *goladars* bear evident marks of being made up, and no reliance can at all be placed on them. Perhaps this subject will be taken up with better chance of success when the determination of the area under wheat will be attempted.

3. On the subject of the improvement of the species of wheat, I have, as already reported, tried some Buxar and Cawnpore seed in several places in Bhagulpore and Monghyr. It is too early to give any idea of the measure of success with which my attempt in this direction may meet. The plants have come up well and give promise of a good crop. The grain was to some extent weevilled, and therefore about 12 annas of the seed has germinated. I was under the impression that some of the Bhagulpore grown samples would compare well with those of Buxar and Cawnpore, and on reference to the Chamber of Commerce, Calcutta, I was disabused of this impression.

4. Adverting to your paragraph 7 of the letter under reply, I have the honour to submit that the scheme of inspecting and grading wheat, advocated by Messrs. Reinhold of Cawnpore, is not at all suited for the condition of the trade now carried on in Bhagulpore and Monghyr. The *goladars*, through whom this trade is carried on, have tiled sheds for storage of grain. The accommodation, though not very good, is nevertheless sufficient for purposes of giving temporary protection to the grain. The *goladars* are both brokers and warehouse-keepers, and I do not think they can be induced to undertake to winnow the grain, or otherwise prepare it for the English market. It is hoped something in this direction may be done in future, and perhaps the market prices supplied to us by the Chamber of Commerce, and the translation of which is distributed among the *goladars*, will have some effect in inducing them to pay some attention to export clean grain.

No. 80T, dated Camp Satgachia, the 8th December 1885.

From—E. E. Lowis, Esq., Officiating Commissioner of the Burdwan Division,
To—The Secretary to the Government of Bengal, Revenue Department.

With reference to your No. 1427—104Agri. of the 25th July last, and its enclosures, regarding the cultivation of wheat in this division, I have the honour to submit the following report.

2. The crop is cultivated in a limited scale in this division. In Burdwan the area under wheat during the past year was 8,610 bighas, and the produce about 27,200 maunds, of which one-third was locally consumed, and the remaining two-thirds exported to Calcutta.

3. In Bankoora the quantity grown is too small to admit of exportation; it is not even sufficient to meet the requirements of the people of the district. The wheat that is generally in use in the district is imported from Patna and other places.

4. In Beerbhoom wheat is not a staple crop, nor is there any land devoted exclusively to its production. The area of land under wheat cultivation is not known with any approach to accuracy, but is roughly estimated at 2,500 bighas, or $\frac{1}{360}$th part of the total cultivated area of the district. There are two kinds of soft white wheat grown, having the local names of *jowale* and *dudhe*, the outturn per bigha being about 3 maunds.

5. The wheat raised in the district is for home consumption, and in addition an equal quantity is imported from adjoining districts, and from Behar in the shape of grain and from Calcutta in the shape of flour. These rough estimates would therefore give 7,500 maunds as the quantity raised at home, and 7,500 maunds in grain and flour as the amount imported.

6. In Midnapore the total area under wheat cultivation may be estimated at about 2,000 bighas. The little wheat that is grown in the district is not exported to any other district, but is locally consumed. No trade in this article is carried on to any large extent, but the local demand is generally met by importation of machine-made flour from Calcutta.

7. In Hooghly wheat is grown on a very limited scale in the Jehanabad sub-division only. The quantity raised there is never exported, but sold in the local markets for the preparation of flour. The total value of the crop grown in the sub-division will not exceed one thousand rupees a year. There are two principal marts—Babugunge and Buddessur—in the district where wheat is imported to a large extent. About 20,000 maunds are imported annually to the former from Monghyr, Jamalpore, Cawnpore, &c., of which about 15,000 maunds meet the demand of a flour-mill situated in the place, and the rest is sold locally; while about 12,000 maunds are imported yearly to the latter (Bhuddessur), which amount is sold to meet local demands.

No. 196, dated Burdwan, the 11th December 1885.

From—A. C. Sen, Esq., C.S., Assistant to Director of the Agricultural Department, Burdwan Division,
To—The Director of the Agricultural Department, Bengal.

With reference to your letter No. 415, dated 2nd September last, I have the honour to state that, considering the insignificance of the wheat cultivation in the Burdwan Division, I do not consider a special report on the subject is needed.

2. Wheat is cultivated in this division, chiefly on the newly formed alluvial lands along the banks of the Ganges, Damodar, and other large rivers. The yield per bigah will not be more than four maunds on the average, and this shows that the ryots have no inducement to cultivate wheat in preference to oilseeds, the pulses, and other *rubbee* crops.

3 There is a good deal of wheat land in the division, which, however, could not be worked for wheat for want of a sufficient supply of water. These lands lie mostly along hill sides, and are at a considerable height from the ordinary water-level.

4. In accordance with the last part of paragraph 8 of your letter No. 415, dated 2nd September, I have been trying experiments both to improve the quality and extent of the cultivation of wheat in Burdwan, Hooghly and Bankoora, a report on the results of which will be submitted to you in due course.

No. 155, dated Burdwan, the 21st April 1886.

From—A. C. Sen, Esq., Assistant to Director of the Agricultural Department, Burdwan,

To—The Director of the Agricultural Department, Bengal.

With reference to your demi-official letter No. 144, dated the 17th instant, asking me to supply you with further information on the subject of wheat cultivation, I have the honour to report as follows.

2. Experiments were made with three different varieties of wheat, viz.—

Shahabad white wheat,
Mozuffernagar soft white wheat,
and red hard wheat.

These experiments were made partly in the Burdwan farm, and partly in the interior of the Burdwan, Hooghly, and Bankura districts Altogether about 25 places were selected, of which some of the places seldom grow any wheat. Manure experiments with wheat were tried only in the farm, and the only manure applied was bone meal.

3. The experiments, with a few exceptions, have been successful. Agricultural experiments depend so much on the state of the weather and other very variable conditions that it would not be quite proper to come to any definite conclusion from one year's experiments; but so far as these go, the following inferences may be made :—

(*a*) The cultivation of wheat may be greatly extended. In some places, such as Burrakar in the Burdwan district, and the Government villages of Moozpore Peasara, and Pearapore, the cultivation of wheat would prove very profitable, as this could be done on lands which generally lie idle during the wheat-growing season.

(*b*) Of the three varieties experimented upon, the Shahabad wheat appeared to be best suited to the places where the experiments were made. Both in yield and quality it is superior to the local variety. The hard wheat took the second place. The Mozuffernagar wheat suffered much from rust. The disease was no doubt imported with the grains, for the Shahabad wheat growing on a similar soil, and side by side with it, was quite free from it.

(*c*) Bone meal proved itself a very good manure, and it would be, I think, much safer to use bone meal than saltpetre.

No. 998R, dated Chota Nagpore, the 20th November 1885.

From—The Commissioner of the Chota Nagpore Division,

To—The Secretary to the Government of Bengal, Revenue Department.

(Through the Director of Agriculture, Calcutta.)

With reference to your endorsement No. 1426—103 Agriculture, dated the 25th July last, and annexures, regarding the cultivation and trade in wheat, I have the honour to submit the following report.

2. None of the districts in this division are properly speaking wheat-producing districts. In Hazaribagh the wheat-producing tracts are the valley of the Sukre river in the Giridih sub-division and the western and north-western thanas of Chattra, Chowparan, and Huntergunge. According to a rough estimate, the area under wheat cultivation is found to be 2,500 acres only, which bears but a very small ratio to the entire area of the district. In Lohardugga wheat is not cultivated to any considerable extent, except in the Palamow sub-division, where the cultivation has extended of late years. In Manbhoom and Singbhoom the cultivation is insignificant. In the latter barely 2,000 bighas are said to be cultivated with wheat.

3. The best wheat soil is *kewal* or black clay. The next best is *balsunder* (clay mixed with sand). The other good wheat lands are *bari* or land adjacent to the cultivators' homestead, which is always rich in manure, formed by house refuse, ashes, and cattle dung; the turrie or low land on the banks of rivers and streams, and having facilities for irrigation and the dried up beds of *ahurs* or water-catchments.

4. In Hazaribagh three varieties of wheat are grown, viz.—

(1)	*Dudhia*	...	Superior white, soft.
(2)	*Lalka*	...	Red and hard.
(3)	*Hardin*	...	Reddish, small, and hard.

In Lohardugga six varieties are reported to be grown, viz.—

(1)	*Jagua*	...	Reddish in colour.
(2)	*Dudhia*	...	Milky white.
(3)	*Murila*	...	Nearly beardless.
(4)	*Karikura*	...	Darkish in colour.
(5)	*Dessila*	...	Acrid and coarse.
(6)	*Maghaiha*	...	Barley-like and pungent in taste.

In Manbhoom only a red variety is grown.

5. The preparation of the soil for sowing commences in April. The land is sometimes turned up with the spade. It is then ploughed over a good many times, and thus made soft and light In July and August it is manured with cow-dung and ashes, and also with the droppings of cattle let loose upon it. Sowing commences in September and October. About half a maund of seed is sown broadcast on a *bigha* of land to secure a good outturn. Watering commences when the plants have grown to a height of three or four inches The number of watering depends on the rainfall of the season and the situation of the land. As a rule, watering is continued at intervals of eight or ten days till the grain appears and begins to swell. From three to six waterings are given according to the state of the weather. The crop thrives under a moderate west wind, but damp and easterly winds produce mildew and blight. It is cut about the middle of March. The sheaves are stacked on the *khullian* or threshing-floor, which is nothing but bare ground cleaned and washed with a solution of cow-dung and mud. Here the sheaves are trodden over by bullocks to separate the grain from the stalks, and the chaff is separated from the grain by the action of the wind. A man stands on a high place, and taking a basketful of grain pours the contents down, and the chaff is blown away by the wind as he does so. No threshing or winnowing machines are in use.

6. The outturn of wheat varies considerably according to the quality of the land. The following estimate per acre is made by the Deputy Commissioner of Hazaribagh :—

	Maunds.
On manured and irrigated soil	40 to 50
On manured soil, not irrigated	25 to 35
On unmanured, but irrigated soil	20 to 30
On unmanured and irrigated soil	15

7. Wheat is often grown along with crops of mustard, linseed, grain or barley. This accounts for the presence of foreign grain with wheat. The cultivator does not take sufficient care to clean the wheat by removing the dirt of the threshing floor and the grains of the second crop grown with it before bringing it to the market for sale. Intentional adulteration of the grain is not as a rule practised.

8. In the cultivation of wheat the following rotations of crops is observed : It is grown alternately with either *makai* (Indian-corn), *marua*, *goondli* or sugarcane ; the soil is seldom left fallow.

9. Wheat is not exported from any of the districts of this division. The local produce is not sufficient for local consumption, which is small, as only the upper classes of the Hindus and the Mahomedans consume wheat, and they do so rather as a luxury. Wheat is imported into the division from Patna, Gya, Cawnpore, &c.

10. As this division does not export wheat, the question of establishing central depôts for cleaning the grain near railway stations does not arise.

No. 7MA, dated Calcutta, the 27th January 1886.

From—A. Smith, Esq., Commissioner of the Presidency Division,
To—The Director of the Agricultural Department, Bengal.

With reference to your letter No. 113, dated the 22nd instant, I have the honour to submit the following report on the cultivation of, and trade in, wheat in this division.

2. The report from the Collector of Moorshedabad has not yet been received. although several ordinary and special reminders have been issued. This report will therefore contain information with regard to four only out of the five districts in this division. I will, however, submit a supplementary report on receipt of the report from the Collector of Moorshedabad, to whom another urgent reminder has this day been issued.

3. There is no cultivation of, or trade in, wheat in Khoolna. The report for that district is therefore blank.

4. The cultivation of, and trade in, wheat in the 24-Pergunnahs is very limited. Only a small area in the nothern part of it, near Goberdanga, thana Habra, is under wheat cultivation, and the yield is of a coarse sort, generally called red wheat. The whole of the outturn is exported to Dum-Dum for the consumption of the troops there. The

opening out of the Bengal Central Railway has given ample facilities for the transit of the wheat to Dum-Dum, and no special provision seems to be necessary for its storage after it has been brought to the railway station. At present the wheat is bagged and brought to the railway wagons on carts and taken down to Dum-Dum. The wheat thus brought to Dum-Dum contains an admixture of indigenous matters, but here it is cleaned, winnowed according to the native system, ground by small millstones, and reduced to flour. The Collector thinks that some improvement in the processes of grinding and winnowing the wheat is feasible if portable thrashing-machines could be invented for the purposes; but considering the small area under wheat cultivation, Mr Paul is not sanguine that the cultivation will improve, or that the trade in wheat in his district will develop.

5. The cultivation of wheat is, on the whole, not a favourable pursuit amongst the agriculturists in the 24-Pergunnahs. Rice is the staple crop, and it is largely cultivated, as the soil is better adapted for its growth than for any other cereal crops. Again, the traffic in rice is more paying than that in wheat, as the former finds re dy sale in every part of the district, whereas the paucity of consumers of wheat compels the dealers to select places, such as Calcutta, Dum-Dum, Barrackpore, and Alipore, for the disposal of their stock. The Sub-Divisional Officer of Baraset says : " The area now under paddy cultivation hardly suffices for the production of the quantity of rice that is wanted for local consumption. The people have to depend very much for their supplies of rice upon the Bussrihat sub-division, and tracts bordering on the Sunderbuns, which are popularly called the *bada abad.* Jute and sugarcane cultivation have been increasing of late, because these two crops are paying ones. The marshy and low lands which form the greater portion of the agricultural lands of this place are more fitted for *amun* cultivation than for any other crops. Under the circumstances, the chances of wheat supplanting the jute and sugarcane crops, which are grown on all available high lands here, are very small, and therefore no special measures are needed for encouraging wheat cultivation in the sub-division."

6. Mr. Paul thinks that any attempt made to encourage the cultivation of wheat in his district would be futile. High lands are required for its cultivation, but such lands, with a very few exceptions, are generally let for the cultivation of cold season fruits and vegetables at about double the rate of rent current for paddy lands, whereas the profit derivable from the cultivation of wheat is, as observed above, less even than that of rice. The growing demand for rice for shipment, for jute at the several mills and presses in or about the metropolis, for sugarcane and vegetables in the Calcutta markets, and the high price which they fetch—these have almost ousted the cultivation of other cereal crops from the district.

7. In Nuddea a large quantity of wheat is grown in the Sudder sub-division, about a hundred thousand maunds being annually exported to Calcutta by river The sub-divisional officers of Meherpore, Kushtea, and Chuadanga report that only small quantities of wheat are grown in those parts, and that nearly the whole of the produce is wanted for local consumption. The cultivation of wheat in the Ranaghat sub-division appears to be somewhat larger, and there is some exportation of the grain to Calcutta from that sub-division.

8. The local *mahajans* cannot say how much of the wheat, which they send to Calcutta, is consumed in the country, and what quantity, if any, finds its way to the English market. The latter alone, of course, would come under the purview of the resolution of the Punjab Government.

9. The kinds generally grown are two in number. Their vernacular names are *jamali* and *dudhi* (milky). The latter is whiter than the former, though it may not be the "soft white" wheat referred to in paragraph 6 of the resolution of the Punjab Government as commanding a higher price in Europe than other varieties.

10. Small quantities of a third and, apparently, a better variety, are available in the market. The grains of this are nearly as white as those of the *dudhi*, but are larger in size, and are said to yield better wheat. The vernacular name of this species is *gangajali* (Ganges water). It is not cultivated here, but imported from Maldah for local consumption.

11. The average outturn per bigha is 3 maunds, and the price varies according to quality from Rs. 2-4 to Rs 2-8 a maund. Mr Hopkins observes that there does not seem to be much ground for Government interference for providing a cleaner grain for exportation. As a rule, the seeds of the different varieties of wheat are sown separately, and whatever may be the case in the Punjab or elsewhere, neither the actual cultivators nor the middlemen in Nuddea appear to be in the habit of *intentionally* mixing the wheat with other seeds or with dirt. Considering, however, that the thrashing is done by making cattle tread on the grain on a mud floor, and that the winnowing is effected by merely exposing it to the action of the wind, there cannot but be some impurities. But, as remarked by the Director of Agriculture, North-West Provinces and Oudh, even with these rude and simple means " the cultivator can, and often does, clean down to 2 per cent. of impurities, but the consignees insist on deducting 4 per cent. on this account from the purest samples they receive, thereby occasionally making a not wholly deserved profit."

12. None of the mahajans or middlemen of Krishnaghur, who send wheat to Calcutta, seem to have direct dealings with the merchant shippers to England. They state that they have not been hitherto called upon by the mahajans of Calcutta, with whom they have dealings, to supply a cleaner grain ; and if there is such a demand, the supply would no doubt be forthcoming.

13. The suggestions made by Messrs. Reinhold Brothers of Cawnpore to have a cleaning shed at that station, where certificates regarding quality would be granted by a Committee comprised of a railway officer and an officer of Government from the Agricultural Department, could, Mr. Hopkins observes, be hardly meant to apply to any of the railway stations or other central depôts in his district. The importation of wheat from Kushtea, Chuadanga, or Ranaghat is small, and there is at present no railway to Krishnaghur.

14 Generally speaking, Mr. Hopkins concurs with the Director of Agriculture, North-West Provinces, in thinking that, should it really be anywhere necessary to take steps for obtaining a cleaner grain, it is "precisely the kind of thing which ought to be done by private agency, and Government should not interfere unless the Chamber of Commerce find that they are unable to insist on proper arrangement being made."

15. The Collector of Jessore states that his district cannot be regarded as a wheat-producing district in any sense of the term. From enquiries which he caused to be instituted in pursuance of previous orders on the subject, it was ascertained that only about 200 acres were under wheat cultivation in the whole of the district in 1883. There is no reason to believe that there has since then been any increase in the cultivation of wheat in the district.

16. What little wheat is grown is of an inferior quality, and is probably consumed locally. The soil here not being suitable for the growth of wheat, an expansion in the cultivation of, and trade in, this article of produce does not appear to be probable. So far as Jessore is concerned, the question of the advisability of erecting warehouses for cleansing the grain from impurities need not be discussed. It may be mentioned here that some time ago, in accordance with a suggestion from the Government of Bengal, the Sub-divisional Officers in this district were instructed by the Collector to impress on the cultivators the importance of preventing the admixture of any foreign substance with wheat in order that they might realize the proper value for their produce.

No. 8MA, dated Calcutta, the 3rd February 1886.

Memo. by—A. Smith, Esq., Commissioner of the Presidency Division.

Copy of the following, with copy of enclosure, forwarded to the Director of Agriculture, Bengal, in continuation of this office No. 7MA, dated the 27th ultimo.

No. 2310G, dated Berhampore, the 30th January 1886.

From—H. Farrer, Esq., Covenanted Deputy Collector in charge, Moorshedabad,
To—The Commissioner of the Presidency Division.

I have the honour to submit the following report regarding the cultivation of, and trade in, wheat in this district, called for in your No. 13MA of the 10th August 1885.

2. A statement showing, thana by thana, the area under this crop, and the total outturn, is annexed. The quantities are fairly large, but there are no data for ascertaining how much of the produce is consumed at home, and how much is exported elsewhere. The latter quantity, however, cannot be so large as to require special regulations, nor can the trade be so extensive as to render warehouses of the kind suggested necessary.

3. Three varieties of the grain are grown in this district, viz. *gangajali*, *jamali*, and *khere*. They are named in order of quality.

4. Wheat is grown on *mutter* land and is cleaned by winnowing. It is sown in October and November and reaped in March and April. It is quite free from impurities when brought from the cultivators by the traders, but the latter are in the habit of adding to it an admixture of other matter in order to increase the weight. If people would take none but clean wheat, this practice of adulteration might cease; but this cannot be hoped for so long as purchasers continue to look more to the cheapness than to the purity of the grain they buy.

Statement showing the quantity of land under wheat cultivation, &c., in the District of Moorshedabad.

Names of Thanas.	Quantity of land cultivated for wheat, in bighas.	Outturn of wheat, in maunds.
Gokurn station	30,000	1,50,000
Khurgram	300	600
Bhurutpur	450	1,012
Kandi	3,000	3,000
Shahanagar	700	4,200
Mohimapur	Nil.	Nil.
Assanpur	500	2,500
Kallyangunge	200	400
Shagardighi	20,000	60,000

Names of Thanas	Quantity of land cultivated for wheat, in bighas.	Outturn of wheat, in maunds.
Bhagowangola	10,000	30,000
Manullabazar	400	1,200
Shamchurgunge	21,428	1,49,996
Mirzapur	800	4,000
Dewansari	1,400	8,400
Raghunathgunge	5,000	15,000
Sooty	25,000	75,000
Sujagunge	783	3,915
Gorabazar	5,000	15,000
Gowas	39,222	1,57,000
Burara	9,000	28,000
Doulatabad	18,000	72,000
Nawda	25,000	72,000
Harirparah	10,000	30,000
Jellinghee	10,000	40,000
Total ...	2,36,183	9,23,223

No. 294Mot., dated Darjeeling, the 14th August 1885.

From—Lord H. Ulick Browne, Commissioner of the Rajshahye Division,
To—The Director of the Agricultural Department, Bengal.

Referring to Government endorsement No. 1428—105Agri., dated 5th July 1885, with enclosures, I have the honour to state that on the last occasion on which a wheat circular was received from Government, I replied as follows :—

"As intimated in previous reports on the subject of wheat cultivation in this division, no wheat at all is grown in one district of it, and the areas sown with the crop in the other districts are so very small and scattered (chiefly about homesteads) that there is no use in the Collectors of this division attempting to impress anything about it on the very few wheat-growers in their districts. Wheat cultivation in this division is utterly insignificant, little patches being (and that very rarely) grown as a fancy. Wheat is not grown for the purposes of agricultural commerce."

2. As no wheat whatever is exported from this division, and as it would be a waste of money to provide even a salt cellar at any railway station or other place therein for cleaning wheat, I do not propose to send you any report except this letter on the present occasion.

No. 2321—267Agri., dated Calcutta, the 25th November 1885.

Memo. by—W. C. Macpherson, Esq., Offg. Under-Secy. to the Govt. of Bengal, Revenue Department.

Copy of the following forwarded to the Director of the Agricultural Department for information.

Dated Calcutta, the 13th November 1885.

From—S. E J. Clarke, Esq., Secretary to the Bengal Chamber of Commerce,
To—The Secretary to the Government of Bengal, Revenue Department.

I am desired by the Committee of the Bengal Chamber of Commerce to acknowledge receipt of your letter, dated 25th July, with its accompanying papers, on the subject of the wheat trade of the Punjab, with regard to which you request an expression of opinion on the bearing of these papers on the wheat trade in Bengal, with such practical suggestions as the Committee may wish to offer.

2. In reply, I beg to say that the attention of the Chamber has, as requested, been particularly given to paragraphs 7 and 8 of the Resolution of the Punjab Government, which deal with the action of small middlemen in the matter of adulteration, and discuss the question of establishing cleaning depôts at selected stations. The Committee are now enabled not only to express their own views on these points, but also those of the Committee of the Wheat and Seed Trade Association, to whom the papers have been referred for opinion.

3. As regards paragraph 7 of the above Resolution, it is the opinion of the Chamber that Government officers should be instructed to continue to impress upon the cultivators and middlemen the importance of keeping their wheat as clean as possible, and of sowing, as far as practicable, different descriptions of produce in separate fields It might also be explained to them that No 1 Club Wheat, or the Delhi and Buxar varieties of soft white grain, and No. 2 Club, consisting of Cawnpore-Lucknow grain, command a higher price than other descriptions, and efforts might be made to introduce these varieties into districts where only the inferior qualities of grain, difficult of sale for export, have hitherto been cultivated.

4. The mixing of dirt or inferior grains by mofussil dealers is a matter against which the Chamber is unable to suggest any remedy ; but no doubt, when these dealers realise the loss sustained by the reduction of weight paid for, due to excess refraction, they will see their advantage in sending to the market wheat fit for immediate export, thus saving additional charges at the port of shipment.

5. With reference to paragraph 8 of the Resolution of the Punjab Government, it is the opinion of the Chamber that much good would possibly be done in the direction of the development of the wheat trade by improving communications between the districts of growth and the different railway stations by means of cart road feeders. It is considered that central cleaning depôts are neither necessary, advisable, nor practicable, as the expense that would be incurred in using them for cleaning an article of such low primary value as wheat would increase the cost out of proportion to the improved price which might be obtainable for the cleaned grain in the home markets.

C. E. G. & others—Reg. No. 5070C—100—16 8-86.